



Switch Blade

New Holland
TN60D, TN70D, TN75D,
TN60DA, TN70DA, TN75DA
4 Wheel Drive / CAB

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Part No. 02982890

ASSEMBLY MANUAL



Tractors equipped with additional options, special equipment, tractor manufacturer modifications, new tractor models, or Customer alterations may prevent this Mount Kit from being properly mounted to the tractor. Alamo Group is not responsible for modifications to the MountKit to accommodate these differences.

ALAMO INDUSTRIAL

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TO THE OWNER/OPERATOR/DEALER

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START!! Read the safety messages on the implement and shown in your manual.
Observe the rules of safety and common sense!



DANGER

FAILING TO FOLLOW SAFETY MESSAGES AND OPERATING INSTRUCTIONS CAN CAUSE SERIOUS BODILY INJURY OR EVEN DEATH TO OPERATOR AND OTHERS IN THE AREA.

1.


READ MANUAL

2. NO RIDERS.
NO CHILDREN OPERATORS.



3. USE SAFETY SHOES,
HARD HAT, SAFETY
GLASSES, SEAT
BELTS, & ROPS



4. BLOCK UP SECURELY
BEFORE WORKING
UNDER.



1. Study and understand operator's manual, safety signs, and Instructional decals for tractor and implement to prevent misuse, abuse, and accidents.
● Learn how to stop engine suddenly in an emergency. Be alert for passerby and especially children.

2. Allow no children on or near implement or tractor. Allow no riders on tractor and implement. Falling off may cause serious injury or death from being run over by tractor or cutter or contact with rotating blades.

3. Operate only with tractor having Roll-Over Protective Structure (ROPS) and with seatbelt fastened securely and snugly to prevent injury and possible death from falling off or tractor overturn. Personal Protective Equipment such as Hard Hat, Safety Glasses, Safety Shoes, and Ear Plugs are Recommended.

4. Block up or support raised machine and all lifted components securely before putting hands or feet under or working underneath any lifted components to prevent crushing injury or death from sudden dropping or inadvertent operation of controls. Make certain area is clear before lowering or folding.

5. Before transporting, put Lift Lever in detent or full-lift position. Secure the implement for transport by installing Cylinder Stops or Transport Pin on Pull-type implement center axle and Wing Transport Locks on folding implements.
● Attach Safety Chain to cutter and towing unit securely. See Operator's Manual.

6. Make certain that the SMV sign, Warning Lights, and Reflectors are clearly visible. Follow local traffic codes.

7. Never operate with Cutting Head raised if passerby, bystanders, or traffic are in the area to reduce possibility of injury or death from Objects thrown by Blades under Guard or cutter structure.

8. Before dismounting, secure implement in transport position or lower to ground.
● Put tractor in park or set the brake, disengage PTO, stop engine, and remove key, and wait until noise of rotation has ceased to prevent entanglement in rotating parts which can cause injury or death.
● Never mount or dismount a moving vehicle. Crushing from runover may cause injury or death.

5. TRANSPORT SAFELY,
LOCK UP.



6. USE SMV, LIGHTS, &
REFLECTORS.



7. DO NOT OPERATE
WITH CUTTER OR
WING RAISED.



8. DO NOT MOUNT OR
DISMOUNT WHILE
MOVING.



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WARRANTY INFORMATION:

Read and understand the complete Warranty Statement found in this Manual. Fill out the Warranty Registration Form in full and return it to within 30 Days. Make certain the Serial Number of the Machine is recorded on the Warranty Card and on the Warranty Form that you retain.

INTRODUCTION

ABOUT THIS MANUAL:

The intent of this publication to provide the competent technician with the information necessary to perform the CORRECT Assembly to the Alamo Industrial Product. This will, in turn provide for complete customer satisfaction

It is hoped that the information contained in this and other Manuals will provide enough detail to eliminate the need for contact of the Alamo Industrial Technical Service Dept. However, it should be understood that many instances may arrive where correspondence with the Manufacturer is necessary.

CONTACTING MANUFACTURER: (Please help us Help You! Before You Call!)

Alamo Industrial Service Staff Members are dedicated to helping you solve your problem, or your customer's service problem as quickly and efficiently as possible. Unfortunately, we receive entirely to many calls with only a minimum amount of information. In some cases, the correspondent has never gone out to look at the equipment and merely calls inquiring of the problems described to him by the operator or customer.

Most calls received by Alamo Industrial Service can be classified into approx. 6 general categories.

1. Hydraulic or Mechanical Trouble Shooting.
2. Request for Technical Information or Specifications.
3. Mounting or Fitting Problem.
4. Special Service Problem.
5. Equipment Application Problems.
6. Tractor Problem Inquiries.

HOW YOU CAN HELP:

Make sure the call is necessary! Most of the calls received may not be necessary if the Dealer Service Technician would do the following.

1. Check the Service Information at your Dealership provided by Alamo Industrial, This would include, Service Bulletins, Information Bulletins, Parts Manuals, Operators Manuals, Assembly Manual or Service Manual, many of these are available via the Alamo Industrial Internet site (www.Alamo-Industrial.Com). Attempt to diagnose or repair problem before calling.

2. If a call to Alamo Industrial is needed, Certain Information should be available and ready for the Alamo Industrial Service Staff. Such information as, Machine Model, Serial Number, Your Dealer Name, Your Account Number and Any other information that will be useful. This information is vital for the development of a prompt and correct solution to the problem. This will also help to develop a database of problems and related solutions, which will expedite a solution to future problems of a similar nature.

3. The technician may be asked to provide detailed information about the problem including the results of any required trouble shooting techniques. If the information is not available, The technician may be asked to get the information and call back. Most recommendations for repairs will be based on the procedures listed in the Service Manual / Trouble Shooting Guide and Information provided by customer.

CONTACT ALAMO INDUSTRIAL:

Alamo Industrial, 1502 E. Walnut St. Seguin TX. 78155, Technical Service Dept. PH: 830-379-1480

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NOTES

Section 1

Model Specifications

STATEMENT OF POLICY

It is the policy of Alamo Group to improve its products where it is possible and practical to do so. Alamo Group reserves the right to make changes or improvements in design and construction at any time without incurring the obligation to make these changes on previously manufactured units.

SPECIFICATIONS - SWITCH BLADE

This manual was carefully prepared by Alamo Industrial in an effort to aid the repair technician in keeping the performance of this mower up to the high standards for which it was designed. Its purpose is to cover safety and to give recommendations for the proper repair, care and operation of the mower. The repair person will want to be totally familiar with this manual so that they will be better able to handle day to day service adjustments, maintenance and any necessary repairs.

For the purposes of product improvement, Alamo Industrial Company reserves the right to make changes in design, material or specifications without notice and without liability therefore.

READ THIS BEFORE BEGINNING ASSEMBLY, REPAIRS OR TESTING:

The Switch Blade: The Switch Blade has an independent hydraulic system to operate the motor and the cylinder system. This system uses a tandem pump for hydraulic supply and its own independent oil reservoir. Use caution not to contaminate this system.

DO NOT

1. **DO NOT** short any wires across or allow them to be shorted out.
2. **DO NOT** attempt to jump across any wires or supply them with alternate power source.
3. **DO NOT** install higher rated fuses than are recommended by manufacturer.
4. **DO NOT** attempt to repair or adjust a component that is not intended to be repaired, example sealed components as there are no serviceable components inside.
5. **DO NOT** let anyone attempt any testing or repairs unless they are an experienced and qualified technician. Technicians must have proper tools, gauges, meters etc. to perform proper diagnosis and/or repairs.
6. **DO NOT** perform any repairs with dirty tools or in dirty area. When working on hydraulic components keeping system clean and free of contamination is important.
7. **DO NOT** start or engage system if the oil level is not at the proper level or condition. Never start or run unit low or out of oil. If installing new pump never start engine unless pump & system has been filled with oil, starting a pump dry will damage it.
8. **DO NOT** install / add any oil unless you know it is the correct type and the container is clean. Make certain the oil is not contaminated with dirt or any liquid.
9. **DO NOT** Make repairs if it is going to be unsafe for you or the people around you, it is the repair persons responsibility to secure the tractor and the surrounding work area. Tractor should be disabled in a way that it cannot be started until the repair technician is ready to do so.
10. **DO NOT** use teflon tape or other pipe joint tape on fittings or hose connections. For pipe threads, use a pipe thread sealant compound suitable for hydraulic service on OD thread.

SPECIFICATIONS - SWITCH BLADE

The OCCUPATIONAL SAFETY AND HEALTH ACT (1929.51 Subpart C) makes these minimum safety requirements of tractor owners and operators:

Required of the Owner:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard;
2. Provide Seat belts that meet the requirements of this paragraph of this Standard SAE J4C;
3. Ensure that each employee uses such Seat belt while the tractor is moving;
4. Ensure that each employee tightens the Seat belt sufficiently to confine the employee to the protected area provided by the ROPS.

Required of the Operator:

1. Securely fasten seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going - especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

Safety Recommendations!

It is the business philosophy of Alamo Industrial Company to manufacture safe products for use by our customers. In the interest of your safety, we are bringing to your attention practices that can avoid serious injury. It is our belief that trained operators can avoid painful experiences by carefully reading and adhering to the following recommendations. As a repair technician do not modify this product in any way that will make this unsafe for the operator or anyone else around it.

WORK SAFELY. Most of the repairs can be performed by one man, but some of the parts are very heavy. **GET HELP IF YOU NEED IT.** Use the right tools for the job. A floor jack or hoist will be a big help, but make sure they are in safe condition. Keep the floor free from oil and grease so you don't slip. **WEAR SAFETY GLASSES, SAFETY SHOES AND GLOVES** and make sure your helper does too. This machine can be dangerous if not operated safely. Do not operate it until you have read and understand all safety and operation recommendations in Operators, Assembly, Service manuals.

DANGER



Know the equipment, learn to operate it correctly in a safe, level, open secure area before trying to operate this unit in tight places or around other objects or people.

When stopping, shut off the mower, disengage PTO, Engage Tractor Parking brake. Shut off tractor engine and be certain all rotating or moving mechanisms have stopped before attempting to get near mower. Make certain that tractor is secured in a way that it can only be started if you are ready for it to. This could include remove key and put it in a secure place. Disconnect battery cable which should be done before any repairs or service is started.



CAUTION

1. KEEP ALL SHIELDS IN PLACE
2. STOP MACHINE TO ADJUST AND OIL
3. IF MECHANISM BECOMES CLOGGED SHUT OFF POWER BEFORE CLEANING
4. KEEP HANDS, FEET AND CLOTHING AWAY FROM POWER-DRIVEN PARTS
5. KEEP OFF MOWER AND KEEP OTHERS OFF
6. WARN BYSTANDERS TO KEEP AWAY

SPECIFICATIONS - SWITCH BLADE

Standard Specifications: Switch Blade 5 ft. & 6 ft.

Break-A-Way Control.....	Hyd Pressure Contol Valve Block
Break-A-Way Relief.....	1500 psi Relief
Break-A-Way.....	Hydraulic Rotary Actuator, Self Returning
Cutting Size.....	Up to 1/2" in Dia. Material
Cutting Width.....	5 ft. or 6 ft. Option
Drive System.....	Hydraulic Motor
Hydraulic Cylinder Control.....	Two Spool Control Valve
Hydraulic System.....	Self Contained
Hydraulic Tank.....	Steel Manufactured Type w/ Built in Mount
Hydraulic Filter.....	Standard, Tank Mounted
Hydraulic Oil Return Pressure Gauge.....	Standard, Tank Mounted
Hydraulic Hoses.....	High Pressure Standard
Hydraulic Hose Length.....	Varies with the Tractor Model
Knife Drive.....	Planetary Drive Assembly
Knife Rock Guards.....	3" Heavy Duty Industrial Bolt On
Knife Speed Control.....	Pre-Set Governor
Knife Type.....	Serrated Edge Standard
Lift & Fold.....	Hydraulic Cylinders Standard.
Motor Control.....	Electric over Hydraulic
Motor Control.....	Electric "ON" or "OFF" Selection
Motor Function.....	Electric Reversible Drive Direction
Mount Type.....	Side Mount to Tractor Standard
Mounting to Tractor.....	Factory or Field Mount Option
Operators & Parts Manual.....	Standard, Extra Copies Optional
Paint.....	Yellow Standard, Special Colors Optional
Pump Guard.....	Optional
Pump Mounting.....	Tractor Engine Driven
Pump Size.....	2 Size Option (CID)
Pump Type.....	Tandem Gear Pump
Pump Pressure.....	Motor Circuit..... 1750 psi @ 9 to 10 gpm
	Cylinder Circuit..... 3000 psi @ 3.5 to 4.5 gpm
Skid Shoe Replacement.....	Bolt on
Skid Shoe Size.....	Standard 3/16" Abrasion Resistant Alloy
Skid Shoe.....	Standard w/ AG Shoe & Swathboard Option
Transport Locks.....	Standard, Manual Lock
Transport.....	Hydraulic Lifting and Folding

USING AN ADAPTER WITH A TORQUE WRENCH

How To Compute Torque When Using An Adapter

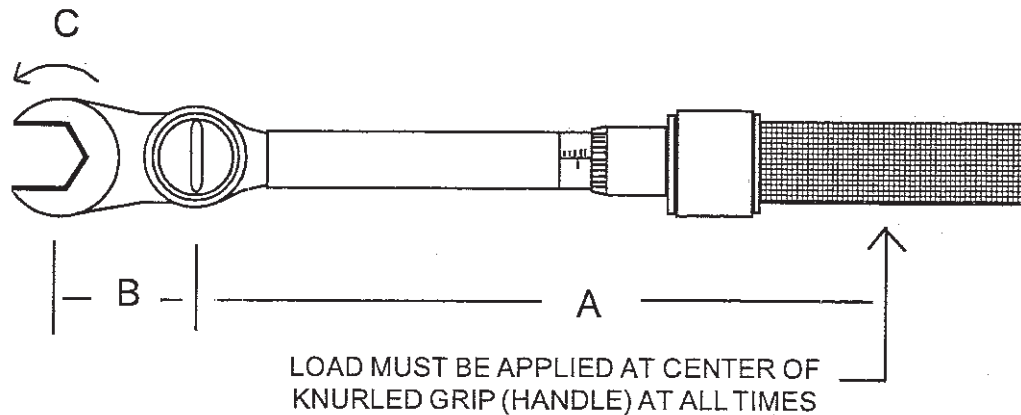


Figure 1

Typical Torque Wrench Shown

If an adapter is attached to the drive of a torque wrench, the wrench will not give actual torque indicated by the setting of the handle. A simple formula however, allows you to figure out what the setting should be to deliver a predetermined amount of torque at the end of any adapter to the fastener.

The following letters are defined as:

- A = Length of the torque wrench when set at the middle scale setting (inches).
- B = Length of adapter (inches from center hex bolt to center of torque wrench square shaft).
- C = Desired torque at end of extrusion
- D = Setting for accuracy within + or - 6%.

Here is a typical problem. You have an adapter that adds 10.0 inches to a torque wrench length (dimension B) What should the setting be to obtain 320 ft. lbs. of torque at the end of the adapter.

- A = 22.57 inches (length from adapter mounting point torque wrench to center of grip / handle)
 - B = 10.0 inches (Length from adapter mounting point of torque wrench to center of hex slot).
 - C = 320 ft. lbs. torque (desired torque at end of extension).
 - D = Unknown (setting you need to set torque wrench to = 320 ft. lbs for accuracy).
- $$C = \frac{(A)}{(A + B)} \text{ or } 320 \frac{(22.57)}{(22.57 + 10.0)} = 320 \frac{(22.57)}{(32.57)} = 320 \times 222 \text{ ft. lbs.}$$

Your Answer (D) is a setting of 222 ft. lbs. on the torque wrench will give 320 ft. lbs. of torque at the bolt. By using the above formula an accuracy of + or - 6 % of the desired torque will result at the end of the adapter due to length change during grip adjustment.

SPECIFICATIONS - SWITCH BLADE

HOSE END FITTING TORQUE SPECS:

Hose End Type: 37 Degree Angle End Steel Hose End Fittings*




Dash Size	Nominal Cyl. Size (in.)	Torque in. lbs.	Torque ft .lbs.
-4	1/4"	140	12
-6	3/8"	230	19
-8	1/2"	450	38
-10	5/8"	650	54
-12	3/4"	900	75
-16	1"	1200	100
-20	1-1/4"	1600	133
-24	1-1/2"	2000	167
-32	2"	2800	233

* Straight Threads do not always seal better when higher torques are used. Too much torque causes distortion and may lead to leakage. DO NOT over torque fittings and DO NOT allow any contaminants to enter system through fittings when installing them.

TORQUE VALUES - BOLTS: Recommended Torque, Ft. lbs. & (Nm)




IMPORTANT! Listed below IS BOLT TORQUE and NOT APPLICATION TORQUE, Component Application Torque will vary depending on what is bolted down and the type material (Metal) that is being bolted together. Thread condition and lubrication will vary Torque settings.

Inch Sizes

Bolt Dia. inch	2 (B)  Plain	5 (D)  3 Dashes	8 (F)  6 Dashes
1/4	Not Used	10 (14)	14 (19)
5/16	Not Used	20 (27)	30 (41)
3/8	Not Used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (230)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1396)
1-1/8	330 (447)	910 (1234)	1460 (1979)
1-1/4	480 (651)	1250 (1695)	2060 (2793)

**ALWAYS
CHECK
MARKINGS
ON
TOP
OF
BOLT
HEAD
OR
OTHER
BOLT
DESCRIP-
TIONS**

Metric Sizes

Bolt Dia. mm	4.8 	8.8 	10.9 
6	5	7	12
8	11	20	25
10	20	40	58
12	37	70	105
14	60	100	140
16	92	155	200
18	118	216	280
20	160	270	355
22	215	330	430
24	285	500	700
27	450	875	1000
30	600	1200	1700
33	800	1600	2300
36	900	2100	3000

Section 2

Switch Blade

General Information

New Holland Tractor TL80A, TL90A & TL100A

General Information / Installation Requirements

INTRODUCTION: In Most diagrams there are Component Part Numbers Listed, Item numbers and Descriptions, This is because most parts shown as breakdown in drawings are for location & identification and if available as replacement parts will be listed in the Parts/Operators Manual which are to be used with this assembly manual.

BEFORE STARTING ASSEMBLY: (READ THIS)

1. Clean surrounding area completely before uncapping any connections or Lines. NO DIRT OR DEBRIS CAN BE ALLOWED ON OR NEAR HYDRAULIC SYSTEM IF IT IS BEING WORKED ON. ANY DIRT OR CONTAMINANTS IN SYSTEM NO MATTER HOW SMALL WILL DAMAGE SYSTEM!
2. After cleaning around all connections thoroughly, Do not disconnect any connections, Lines, Hoses, on the Pump, Valve or Tank. Plug all hoses and Lines on Tractor and on Pump, DO NOT leave any open Lines. NO Contamination Should be allowed into system at all.
3. Clean Area, Clean all Tools, Pans etc. The cleaning of Area and Tools **MUST** be done before moving (Cleaned) unit there for assembly.
4. If parts need cleaning, use compressed Air to dry parts after washing (Compressed air must be filtered and moisture free). DO NOT wipe them dry with Paper Towels or Cloth as these will leave lint and/or dust contamination. **DO NOT USE** Compressed Air to spin any component (Such as Bearings or Plates) as this will damage them and could be dangerous.
5. Always use new Seals when assembling Hydraulic system, Lubricate the new rubber Seals with a Petroleum Jelly, (Vaseline) before installing them.
6. Torque all Bolts over Gasket Joints. Then repeat the Torque sequence to make sure Bolts are tight, some times Gaskets can give a Torque reading that is OK but is not, so always recheck Torque.

TOOLS THAT MAY BE NEEDED:

The tools you will need at the assembly site are as follows:

1. Impact wrench or socket and ratchet set.
 2. Rubber mallet.
 3. Box-end, Allen, and adjustable wrenches.
 4. Alignment pins.
 5. Forklift or hydraulic floor jacks with rolling back boards.
 6. Small chain hoist or block-and-tackle.
 7. Multidirectional Levels.
 8. Hydraulic Filter Buggy or Cart.
 9. Safety shoes, safety glasses, and gloves.
- A hard hat should be worn by anyone working under any raised component.

RECOMMENDED GAUGES FOR DIAGNOSTICS:

1. Inlet Vacuum: 30 PSI to 30 in Mercury (207 bar to 0 bar)
2. System Pressure Gauge: 6,000 PSI (700 bar)
3. Charge Pressure Gauge: 0 to 500 PSI (0 to 25 bar)

General Information / Installation Requirements

GENERAL INFORMATION:

Remember to follow each step closely and cautiously. Be aware of all support personnel at all times. Keep the assembly area as clean as possible; clean up all spills when they occur. An uncluttered assembly area and a crew that is sensitive to the hazards involved in putting this implement together will help prevent accidents. Keep all unauthorized personnel from the area. Do not allow children near the assembly site nor allow them on or near the tractor after assembly. There is no safe place for anyone except the operator on the tractor and those assisting with the assembly.

To help you assemble your new Machete Boom and mount it to your tractor, a detailed assembly instruction Manual is being provided with the mount kit to provide detailed instructions and part numbers. Please consult this document for specific information. When needed, you can get additional information or clarification from Your Dealer or Alamo Group Customer Service.

This publication provides general information not specifically for your case or tractor, but, in connection with the drawings, this publication offers you some valuable assistance - please read it thoroughly.

These mount kits are made for selected tractors with standard configurations. Only the noted options and tire sizes listed in the Mounting Specifications will work with these mount kits. Other options, front axles, or different tire sizes may prevent the mount kit from fitting your nonstandard tractor. Alamo Group cannot take responsibility for these problems or any modifications made to the unit.

Throughout these instructions, references are made to right or left directions. Right and left are determined by sitting on the tractor seat and facing the direction of travel forward always.



This is the Safety-Alert symbol. When you see this symbol on your machine or in these instructions, be alert to the potential for personal injury. Follow recommended precautions and safe operating practices.

DANGER!

A signal word - **DANGER**, **WARNING**, or **CAUTION** - is used with the Safety Alert symbol. **DANGER** identifies the most serious hazards.



WARNING!

Safety signs with signal word **WARNING** are typically used to point out more serious hazards.



CAUTION!

General precautions are listed on **CAUTION** safety sign. **CAUTION** also calls attention to safety messages in these instructions.

Tractor, Area Cleanliness

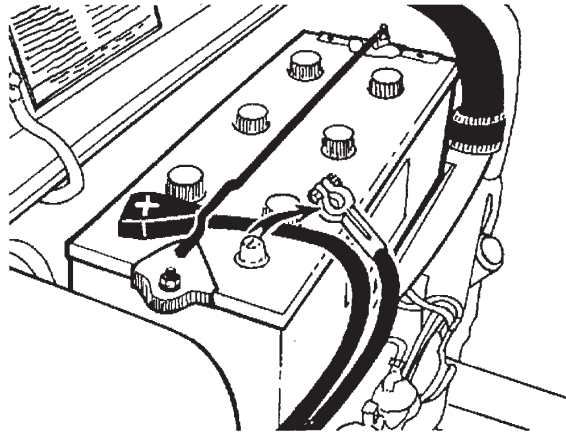
The Tractor, all tools and work area must be clean of dirt and debris when assembling any hydraulic components. DO NOT leave any hydraulic component open to the elements. DO not use any containers for fluids that are not clean and free of any other liquids. DO NOT use rags/cloth that has lint or fuzz on them when working on hydraulic components. Keep all hoses capped until you are ready to connect them.

General Information / Installation Requirements

WARNING!



Disconnect the negative lead (ground) from the battery terminal to prevent any damage to the electrical system.



LEVELING TRACTOR:

TRACTOR MUST be on level ground before assembly is begun. The tractor must be level, All tires must have the proper amount of air in them as per tire and/or Tractors manufactures recommendations.

DO NOT level tractor by over inflating tires. The tractor can be leveled by jacking it up and putting it on jack stands if needed, but this will mean the tractor will be un-level when they are removed. If the tractor does not sit level you must find out why so mower will be level when mounted, if it is mounted with the tractor un-level the mower will be un-level when tractor is leveled.

Replacement Oil Filter

A replacement filter element for return filter assembly should be of the correct type when replaced. This Mower unit's hydraulic components have been carefully cleaned and packaged at the factory to prevent contamination from entering the system. However, dust and dirt particles may enter into the sealed components through transportation, handling, rain, or just sitting in a dirty or harsh environment. Therefore to assure that the hydraulic system is properly clean, please prepare the area where the unit is to be assembled. The area should be on a hard concrete floor that has been swept clean of all dust and contaminants. Unpacked the Mower unit carefully so that the seals on the hydraulic components are not broken or pulled off.

WARNING!



Before attempting to assemble the mower to the tractor, move the tractor to a clean solid surface, preferably a concrete shop surface with an over head crane. The crane should have a rated capacity to lift the heaviest component or assembly. A 5-ton crane is recommended for the assembly work. If a smaller crane is used, be sure not to exceed the rated capacity of the crane.

- Always follow all OSHA crane operating and inspection rules, regulations, inspection requirements, and recommended practices when using the crane.
- Never work under any component that is lifted by the crane unless it is also supported by appropriate stands that are capable of supporting the component.

General Information / Installation Requirements

WARNING! Wear personal protective equipment when assembling the mower. As a minimum that should include:



- Safety Glasses
- Hard Hat

- Safety Shoes
- Hearing Protection

- Gloves
- Welding Helmet

WARNING!

Before attempting to assemble ensure that the tractor engine is off and the tractor transmission is in the park position with the parking brake engaged.



- Remove the engine key and keep it in your pocket to prevent inadvertent starting or movement of the tractor.
- Place wheel blocks in front and behind the tractor wheels to prevent the tractor from moving.
- Never attempt to start the tractor unless properly seated in the tractor seat with the seat belt fastened around you.
- Never attempt to operate the tractor and mower controls unless seated in the tractor seat with the seat belt fastened around you.

WARNING!

Securely block up and support the tractor before attempting to loosen and move the tires. Failure to properly block up the tractor can result in the tractor to suddenly move or fall, crushing you or another worker.



- Never work under any raised component or any component that is not securely blocked up or supported.

WARNING!

Many components of this mower are very heavy and must be handled by proper material handling equipment. Do not lift components that weight over 50lbs by yourself.



- Use an overhead crane, forklift, or other coworkers to lift heavy items. Ensure lifted components are securely supported.
- Never walk or work under a lifted component.

WARNING!

Use extreme care when moving, handling or adjusting the tractor tires. The tires are extremely heavy and could fall and crush you



- Use an overhead crane or forklift to move the tires.
- Properly fasten the tires to the material handling equipment to prevent the tire from falling.

WARNING!

The hydraulic oil is under high pressure and a hydraulik leak can cause oil to be injected under the skin.



- Before starting the tractor ensure all hydraulic connections have been tightened
- Never check for leaks with your hands. Use a piece of wood or cardboard to check for the leak making sure your hands and face are kept away from the leak area.
- Repair any leaks before operating the equipments
- Clean up all oil that has leaked according to the requirements of the oil supplier. Oil residue on the ground can result in injury from slipping or falling.

General Information / Installation Requirements

Lay Out Components in Display. (Example) It is helpful to lay out the component in as neat a display as possible. Lay out the Bolts according to size and length. Lay out the Nuts and washer by size. This will allow you to see how many of each part as you use them and help to identify any missing parts. See Mount Kit Specification and Component Identification Section to help ID Components.

All the component that are received should be check and sorted as to what they are. Shown below is a general example of the components laid out, this may not be a lay out of the components in this mount kit shown below but a generic display of components..



WARNING

DO NOT WELD On This Unit During or After Installation:

DO NOT WELD any components or items on this unit after the installation has begun. The use of electronic modules and components that could be damaged by welding. Before doing any welding check the Tractors Operation, Repair, Service or any other manual from the tractor manufacturer to find any special electronic or special proedures about the tractor electronics. Taking a few minutes to check could save you from doing major damage to the electronics.

Section 3

Switch Blade

Pump & Drive Shaft Installation

**New Holland Tractor
TN60D, TN 60DA, TN70D,
TN70DA, TN75D & TN75DA**

Mount Kit Component Identification

Pump / Driveshaft Schematic

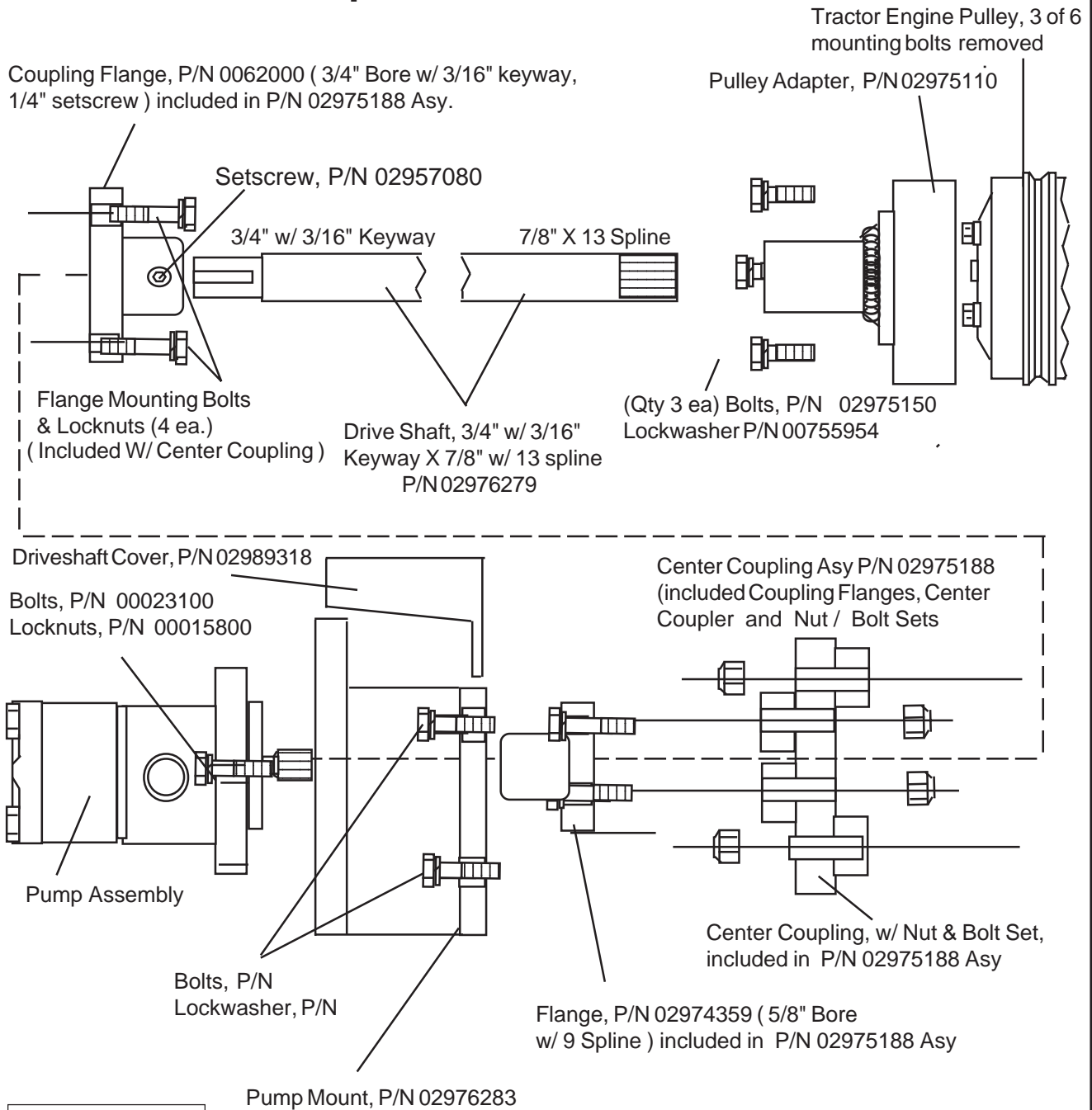


Figure 1

Pump Drive Schematic:

This Section covers the installation of Pump Drive Components, Pump Assembly Some precautions that must be followed during the Assembly Process before unit is ever started for the first time.

Pump & Drive Shaft Installation:

Pump & Drive Shaft Installation:

1. Remove RH Steps & Tool Box. The RH Steps and Tool box (if equipped with) need to be removed as they will not be used as they would interfere with the mower head when i transport position (See Figure 2).

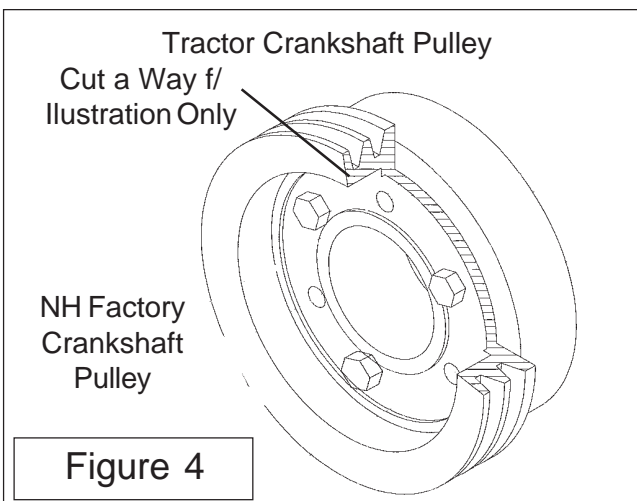
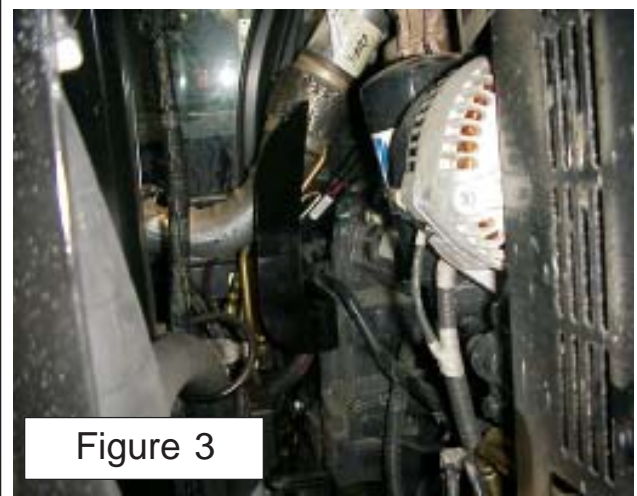
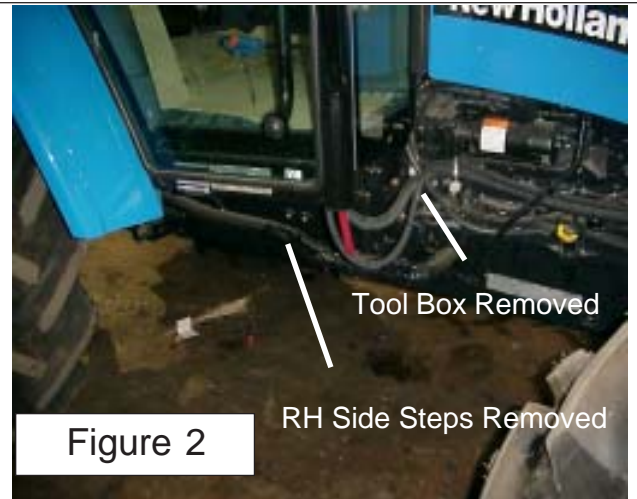
2. Remove Engine Compartment Access Guards. The engine has guards bolted onto the side to prevent access to the front of the engine. These guards need to be removed. The guards and mounting hardware will be reused (See Figure 3).

3. The Engine Crankshaft Pulley. The engine crankshaft pulley WILL NOT need to be removed, the six pulley mounting bolts WILL NOT need to be loosened or removed (See Figure 4). The Crank Shaft Pulley is retained to the engine with six 10 mm bolts (See Figure 4). Three of these six bolts will need to be removed (these three removed bolts will be replaced with longer bolts later (See Figure 4, 5 & 6)

4. Crankshaft Pulley Adapter. The crankshaft pulley adapter P/N 02975110 has three 7/8" holes and three 13/32" holes (See Figure 5). The Crankshaft Pulley has six bolts in the center of it (See Figure 4). Remove every other bolt (3 total) from the crankshaft pulley (See Figure 4), discard these three bolts as they will be replaced buy longer bolts. Locate the three M10 X 70 mm bolts (P/N 02975100 and the three M10 Lockwasher (P/N 00755954). Align the pulley adapter over the remaining three crankshaft pulley bolts.

The 7/8" holes will fit around the remaining three bolt heads. (See Figure 6). The three 13/32" holes are to install the replacement 10 mm bolts as listed above. Tight the 3 replacement bolts seat the pulley adapter down against the crankshaft pulley (See Figure 6). Check the tractor manufactures recommended torque setting for the crankshaft pulley retaining bolts and tight the three replacement bolts accordingly.

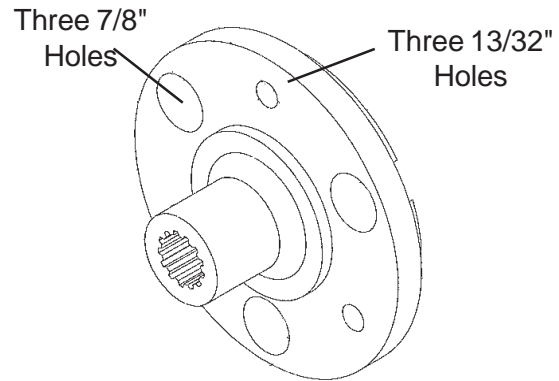
Pulley Adapter has a 7/8" X 13 spline sleeve welded into the center of it (See Figure 5 & 6).



Pump & Drive Shaft Installation:

5. Re-install Engine Compartment Access Guards. The engine compartment guards can be reinstalled after the pulley adapter has been tighten down, use the same bolts to reinstall guard as were taken out to remove them. These guards must be replaced the same as they were removed. DO NOT operate the tractor without these guards installed. The guards and mounting hardware will be reused (See Figure 3).

6. Install Pump Drive Shaft (P/N 02976279). Coat the pump Drive Shaft splined end with a anti-seize compound. Insert the drive shaft under the radiator and into the splined pulley adapter. NOTE: Some tractors have rubber under radiator, if this rubber touches the driveshaft it will have to be trimmed to clear. The rubber under the radiator can be trimmed with a knife. The driveshaft must clear any objects by a minimum of 1/16" and not allowed to rub. The driveshaft has a 7/8" X 13 spline end and a 3/4" w/ 3/16" keyway end (See Figure 7 & 8). The 7/8" x 13 spline end goes toward the engine and fits into the spline hub of the pulley adapter that is bolted to the crankshaft (See Figure 7 & 8)



Pulley Adapter
P/N 02975110

Figure 5

7. Install Flex Coupler Assembly. The flex coupler assembly P/N 02975188 (See Figure 8) is an assembly with center coupler, both flanges and bolt nut sets. One coupler is 3/4" w/ 3/16" keyway (Driveshaft Side) and setscrew while the other (pump side) is 5/8" X 9 Spline. Loosen the setscrew and coat the keyed shaft end with an anti-seize compound before installing coupler. Slide the coupler onto the driveshaft with the 5/8" X 9 spline coupler outward toward where the pump will mount. (See Figure 8). Make certain the 3/16" key is installed into shaft and keyed side of coupler assembly and the setscrew is coated with thread lock and tightened.

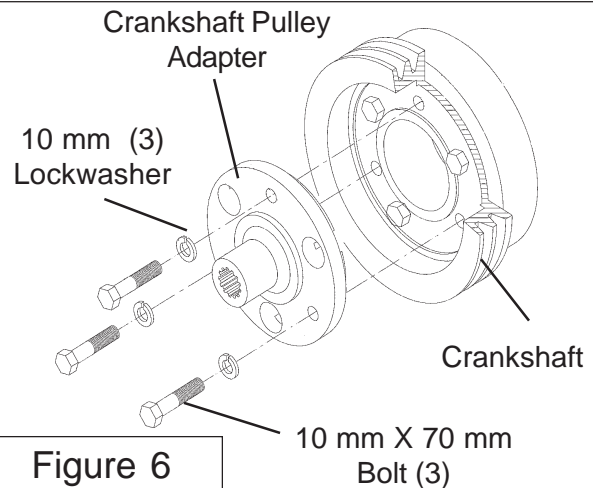


Figure 6

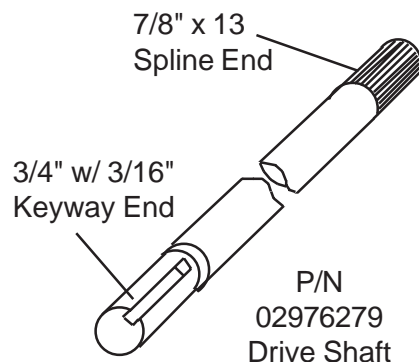


Figure 7

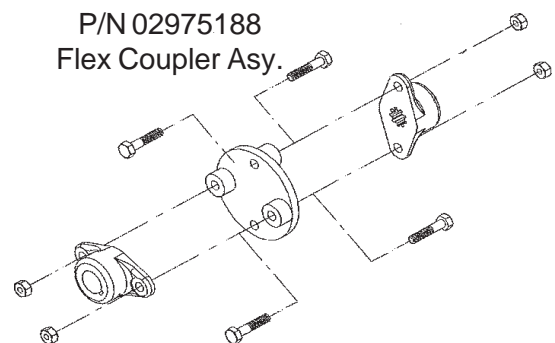


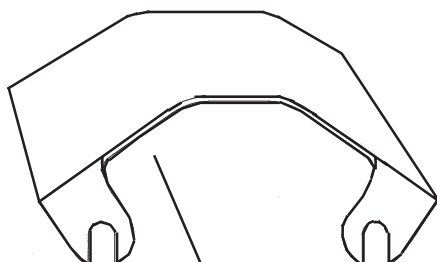
Figure 8

Pump & Drive Shaft Installation:

8. Install Machined Pump Mount Plate. The machined pump mount plate (P/N 02976283) bolts to the front of the bolster in the four existing threaded bolt holes (See Figure 9). These bolt holes will have plastic plugs in them that will need to be removed (See Figure 10). The pump mount Plate bolts to the tractor with 4 mounting bolts (Bolt P/N 02976463) M20-P2.5 X 40MM PL GR10.9 & Lockwasher (P/N 02971158) M20 lockwasher, tighten the two lower bolts down at this time and snug the upper two.

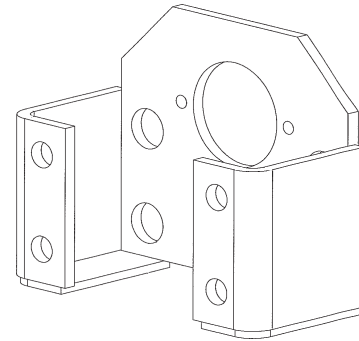
9. Install Pump Assembly. The pump assembly will bolt to the front of the pump mount plate (See Figure 1) with two bolts, locknuts and lockwashers. Coat the splined shaft of pump with a good quality of anti-seize compound. Tighten the pump retaining bolts. Make certain the pump is installed with the suction port of pump toward the LH side of the tractor, this is important. When the pump is bolted down the driveshaft should be checked, it should have a small amount of play in and out, this is important to check to make certain the driveshaft is not bottomed out and in a compression bind from being too long. DO NOT remove any plugs or caps from hydraulic components until they are ready to be connected, this will prevent contamination from entering hydraulic system as shown in figure 12 with hose installed to keep openings covered. (See Figure 12).

10. Install Pump Driveshaft Cover. The pump assembly has a cover that bolts on to cover the flex coupler assembly (See Figure 8) and the driveshaft. This cover (P/N 02989318) is bolted on using the same two top bolts as the pump mount, loosen these two bolts and slide the slotted holes of the cover (See Figure 11) between the bolts and pump mount (Important: DO NOT install these between pump mount and tractor bolster, it will make the pump alignment off).



P/N 02989318
Driveshaft Cover

Figure 11



P/N 02976283
Pump Mount, Machined

Figure 9



Figure 10



Figure 12

NOTES

Section 4

Switchblade

Frame & Hyd Tank Installation

**New Holland Tractor
TN60D, TN 60DA, TN70D,
TN70DA, TN75D & TN75DA**

Frame Installation - Bolt Location

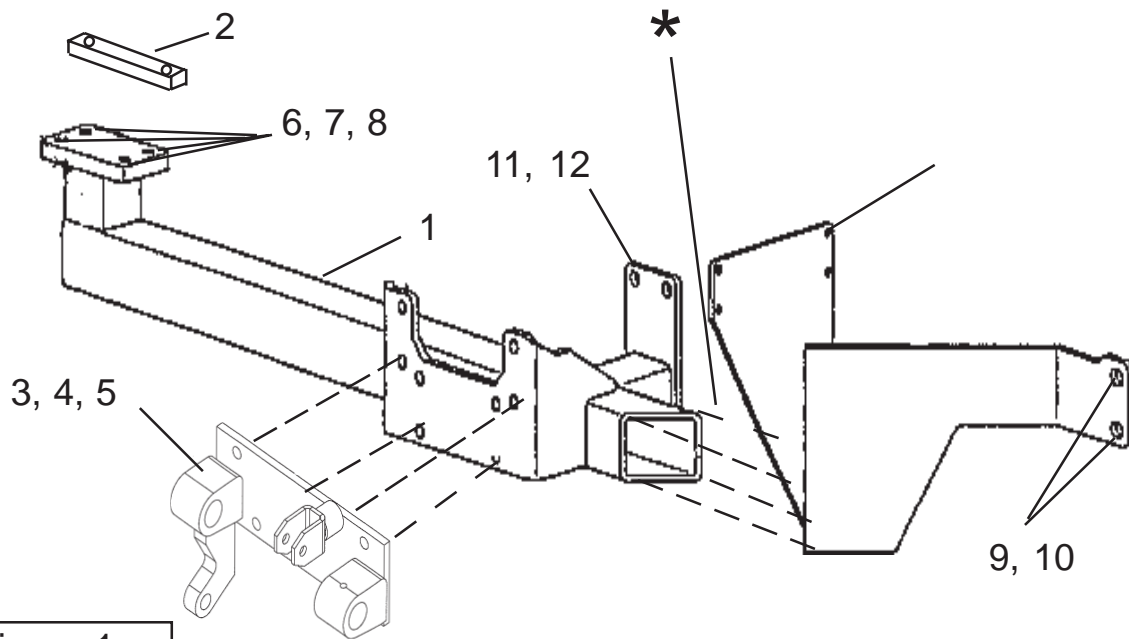


Figure 1

BOLT LOCATION - FRAME INSTALLATION

Item	Part No.	Qty	Description
1.	02980079	1	RH Frame Weldment for Cab Tractor (Shown)
2.	02975125	1	Axle Mount Strap
3.	0665400	1	Subframe Weldment
4.	00753753	4	Bolt, Hex Head 5/8"-NC X 2" - PL - GR8
5.	00695100	4	Locknut, Toplock 5/8"
6.	02965236	4	Bolt, Hex Head 3/4"-NC X 9-1/2" PL GR8
7.	00000200	4	Nut, 3/4 "-NC Hex PL
8.	00003901	4	Lockwasher, 3/4 " PL
	5312316	4	Flatwasher, 3/4" Hardened
9.	02976463	2	Bolt, Hex Head M20-P2.5 X 40MM PL GR10.9
10.	02971158	4	Lockwasher, 20MM
11.	02975738	2	Bolt, Hex Head M20-P2.5 X 70MM PL GR10.9
12.	02971158	4	Lockwasher, 20MM
13.	00023100	4	Bolt, Hex Head 3/8"- NC X 1-1/2" (f/ Hyd. Tank Mount)
	00011100	4	Flatwasher, 3/8" (f/ Hyd. Tank Mount)
	00015800	4	Locknut, Toplock 3/8" (f/ Hyd. Tank Mount)

* NOTE:
Frame shown separated here, this is for illustration only. Frame is a welded assembly, when front section is welded to tube here it will obstruct the view of the mounting lug for illustration (See Item 11,12 Figure 1)

Frame Installation

1. Identify and locate the frame rail (Item 1 Figure 1), Sub-frame Weldment (Item 3 Figure 1) and the Bolts, Washer and Nuts as listed in Figure 1. The tractor will have plastic plugs in the tractor housing, these plastic plugs will need to be removed.

2. Remove RH Side Steps. The steps on the RH side of the tractor will be removed and not used so as not to interfere with the clearance of the mower head. The factory toolbox (if equipped) will need to be removed also for clearance. It will be dealer and/or customers choice on where and whether the toolbox is remounted somewhere else for use. (See Figure 2 & 3). The RH step

3. 3-Point Stabilizer Bracket The RH side 3 point stabilizer bracket will not be unbolted from the tractors RH rear axle housing (see Figure 4). Leave the stabilizer on tractor IT WILL NOT need to be removed..

4. Install Frame Rail to Tractor. The frame rail (Item 1 Figure 1) will be slid under the tractor on the RH side (See Figure 5). Make certain the plastic plugs have been removed from tractor frame, two at the front bolster and two mid frame. Do NOT tighten the frame mounting bolts until all the bolts have been installed as frame will need to be moved slightly for alignment as the bolts are installed. The frame can be installed by balancing the frame on a floor jack, if using this method it is recommended two people perform this to prevent the frame from falling. Raise the frame up to the tractor frame (See Figure 5),

5. Raise the frame rail up under the tractor. until the rear mounting plate is under the rear axle and aligned with the two factory cab mounting bolts on the RH rear axle will need to be removed and replaced with the longer bolts (See Figure 4). Using the jack raise the frame up until it is against the rear axle housing. Install the new bolts, nuts, lockwashers, flatwashers and the axle strap (See Figure 1,4, & 5)

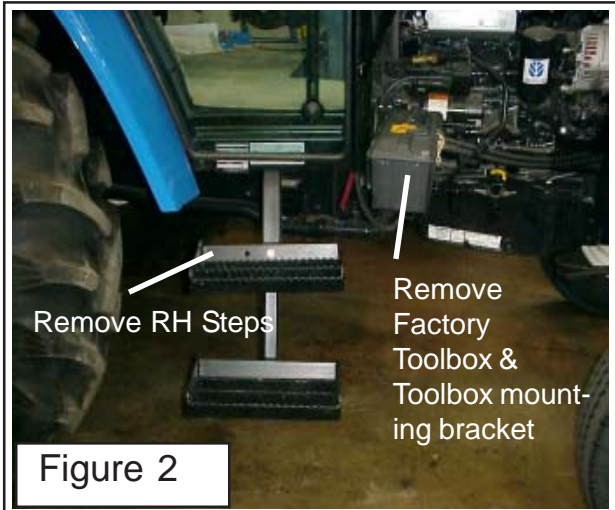


Figure 2

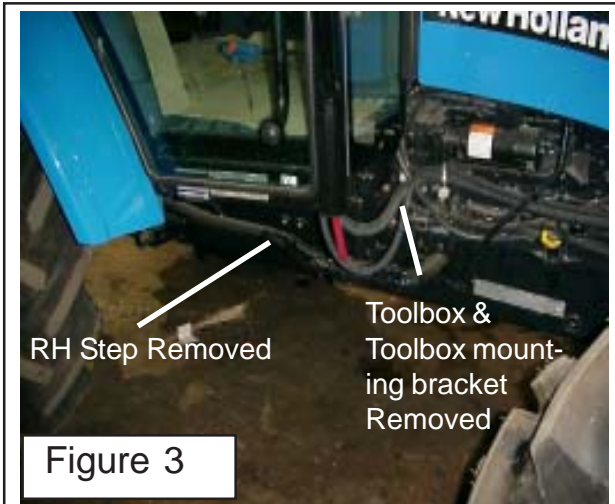


Figure 3

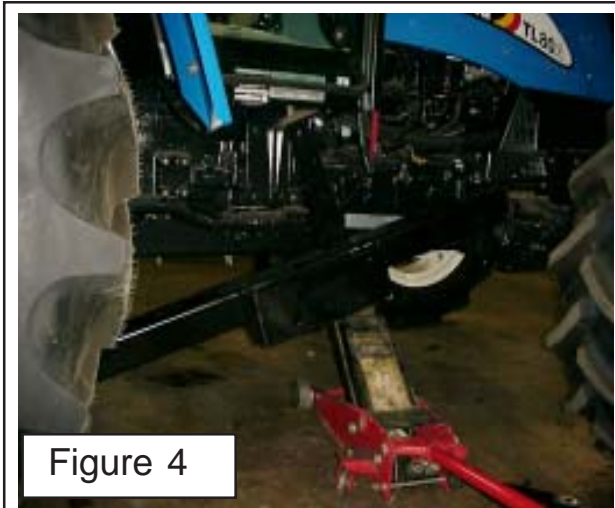


Figure 4

Frame Installation

6. Install Frame Rail Mid Mount Bolts. The front frame rail will mount in two places, the mid mount plate and the front mount plate (See Figure 1 & 6). The mid mount place bolts to the tractor using the same location as the RH front cab mount. Remove the existing cab mount bolts on the RH front corner, Using the M20X 70mm bolts (See item 11 & 12 Figure 1) bolt the mainframe mid mount over the cab mount. Do not tighten these bolts at this time.

7. Install Frame Rail Front Mount Bolts. The front mount bolts use M20 X 40 mm bolts and lockwashers (See Item 6,7 & 8 Figure 1). Install the front mount plate bolts and washers. Tighten the rear mount bolts, mid mount plate bolts and the front mount plate bolts securely. Once these bolts are tightened the floor jack can be removed.

8. Install Sub-frame Mount Weldment. The sub-frame mount weldment will bolt to the side of the frame rail with four bolts, washers and nuts (See item 3,4 & 5 Figure 1). Tighten these four bolts now.

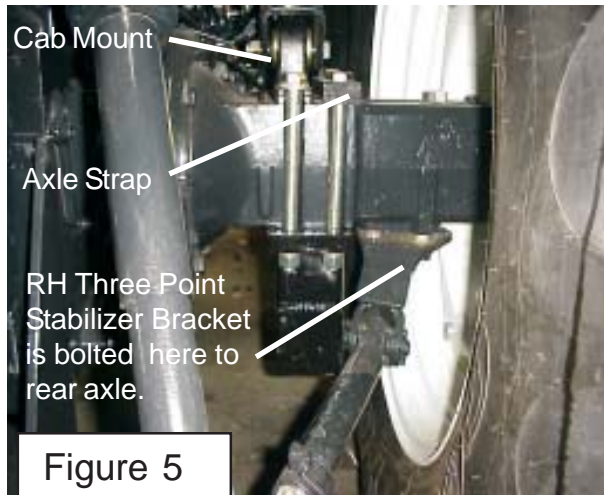


Figure 5

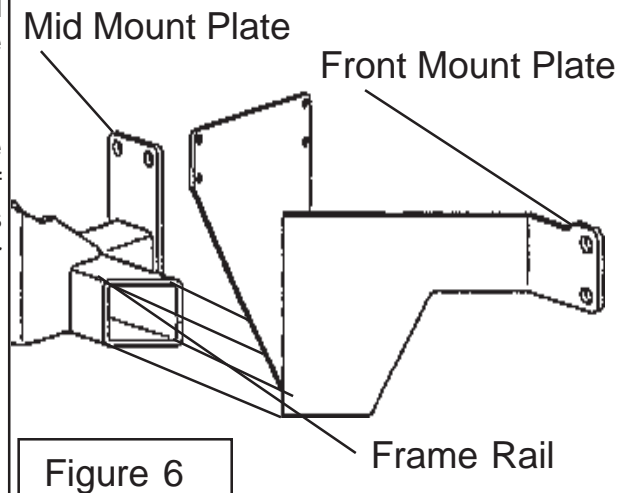


Figure 6

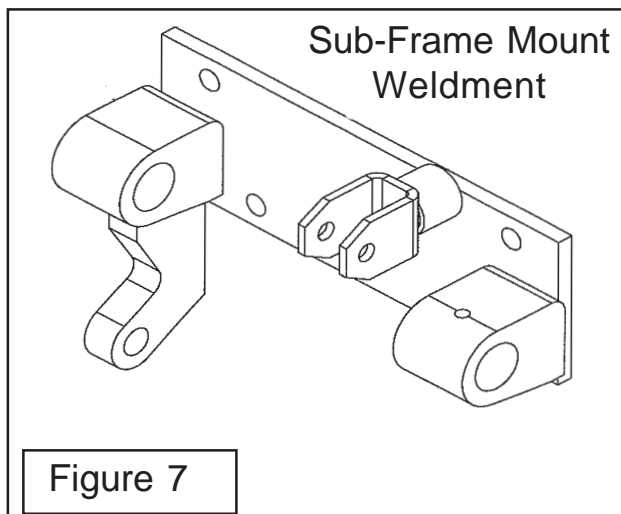


Figure 7

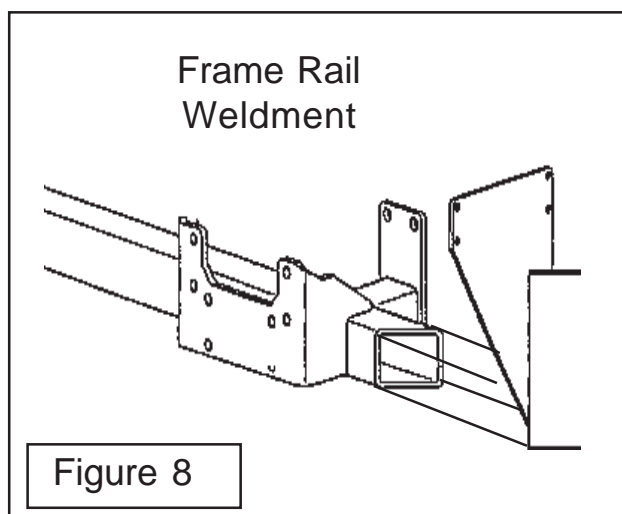


Figure 8

Switchblade (NH-TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA , Asy. Man.) 06 / 05

Frame Installation

9. Replacement Mirror Kit Option. The optional mirror kit will replace the factory outside mirrors with larger dome mirrors on brackets that move the mirror for clearance of mower components. The ROPS model mirror kit will only work with the aluminum canopy option offered as optional by Alamo Industrial, See Component Identification section for details (See Figure 9). Below LH side is shown but there will be bracket and a mirror for the RH side also.



Figure 9

10. Install Hydraulic Tank Assembly The hydraulic tank assembly will mount on the RH side of the tractor to the tank mount bracket. The tank faces to the front of the tractor (See Figure 10)

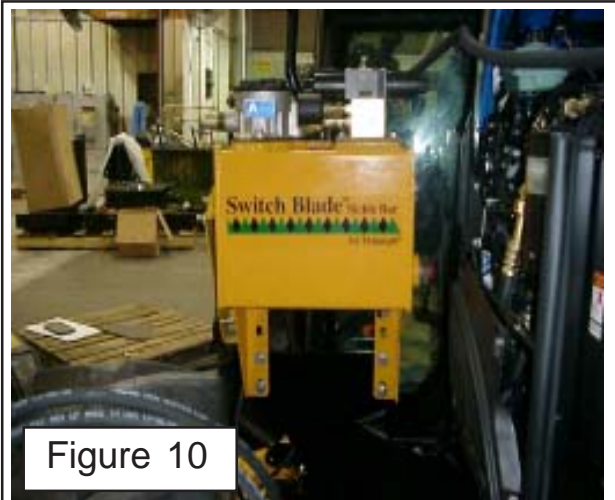


Figure 10

11. Install Operators Manual cannister The Operators Cannister bolts to the RH side of the hydraulic tank (See Figure 11). The cannister should include the operators manual. The Operators cannister should be bolted to the hydraulic tank as part of the tank assembly when shipped.

12. Install Cutter Bar Break-A-Way Relief. The cutter bar hydraulic break-a-way relief valve will mount to the tank, facing the front of the tractor on the RH side of the tractor (See Figure 12). The hose are to be run later according to the hydraulic hose routing schematic.



Figure 11



Figure 12

Switchblade (NH-TN60D, TN 60DA, TN70D, TN70DA, TN75D &TN75DA , Asy. Man.) 06 / 05

Frame Installation

13. Cutter Head Assembly. The Cutter head Assembly is shipped completely assembled with the Skid Shoe, Actuator Pre-Assembly, Carriage Arm, Hydraulic Cylinders, Hydraulic Motor, Drive Assembly, Motor Cover and Cutter Bar Assembly attached (See Figure 13). To mount this the carriage Arm (See Figure 14) which has the Carriage Arm Mounting pin installed in it when shipped will have to have the pin removed (See Figure 13).

14. Install Cutter Head Assembly. Using a hoist lift the cutterhead assembly into position. Install the lift arm pivot pin and install the retaining bolts into the pin (See Figure 14 & 15).

15. Hose Sleeving Material. All hoses will be ran through sleeving material. Check before connecting or installing any hoses to see if they run through the sleeving (See Figure 16)

16. Make Certain Bolts are Tightened. Make certain that the mounting bolts that have been installed so far are tighten. It is recommended that the bolts be marked with a identifying mark (Paint Marker) or some mark that installer will recognize as they already tightened the bolt. This will help prevent missing bolts as it will



Figure 13



Figure 14



Figure 15



Figure 16

Section 5

Switchblade

Hyd. Valve Control Handles & Hyd. Hose Connections

New Holland Tractor TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA

Control Valve & Valve Controls Installation

Control Valve & Valve Controls:

1.. Install Valve Control Handle Mounting Brackets, **ROPS TRACTOR** The valve control stand weldment (P/N 107352) will bolt to the flat operators platform on the RH side and is designe to be bolted to tractor. It is designed to use with ROPS. Install the mount stand where it will be convenient for the operator to use. The control stand weldment is adjustable for height, this is done by selecting the mounting hole you want to use. The stand can be cut for height adjustment if wanted on the ROPS Model. The valve control bracket (P/N 02977335) bolts the stand weldment using the holes that best fir the operators needs (See Figure 1 & 2). Once the right distance is decided to fit operator the valve control mount will bolt to the floor of the operators plat form with 4 bolts. The holes will need to drilled through the floor, check the under side of the floor before drilling any holes to make certain drill bit will not hit and damage anything (See Figure 3). The control valve bolts direct to the valve stand on the ROPS model.

2. Install Control Valve Mount Bracket, **Cab Model**

The cab model uses a bracket that will bolt inside the cab to the fender wall (See Figure 5 & 6). NOTE: For exact instructions on the removal of any upholstery panels consult the tractor manufactures service / repair manual. The inside upholstery panel on the RH side of the fender will need to be removed to find the two threaded mounting holes for the control stand weldment to bolt onto (See Figure 6). The fender upholstery panel will need two holes (See Figur 7) cut in it so the bracket canbe bolted down. These two holes can be cut with a hole saw to make a nice cut. (See Figure 7). Re-install the upholstery panel to the tractor

Install the control Stand Weldment P/N 02981115 to the side panel (See Figure 42)

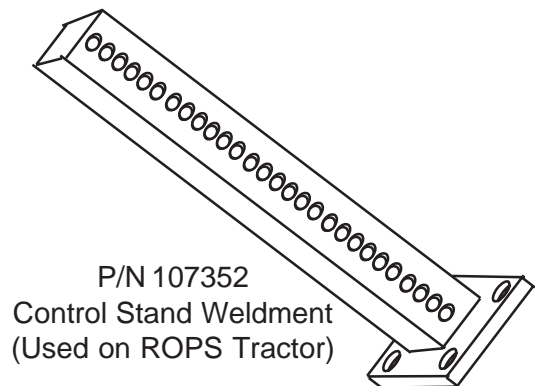


Figure 1

P/N 02977335 Valve Mount Brkt
Weldment (Used on ROPS Tractors)

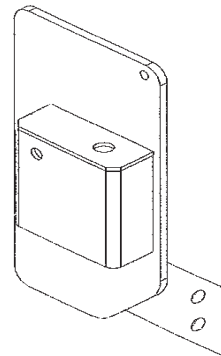


Figure 2

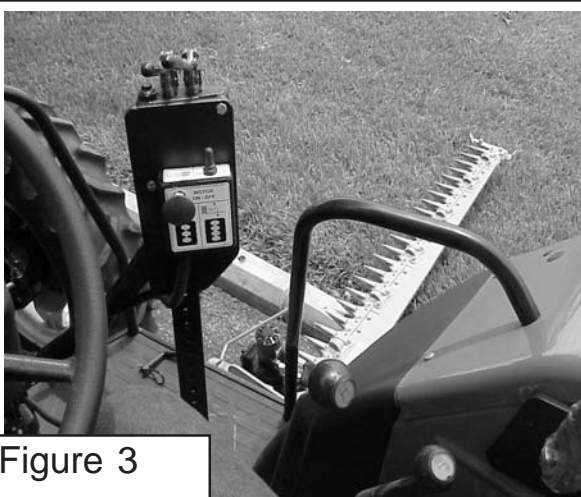


Figure 3



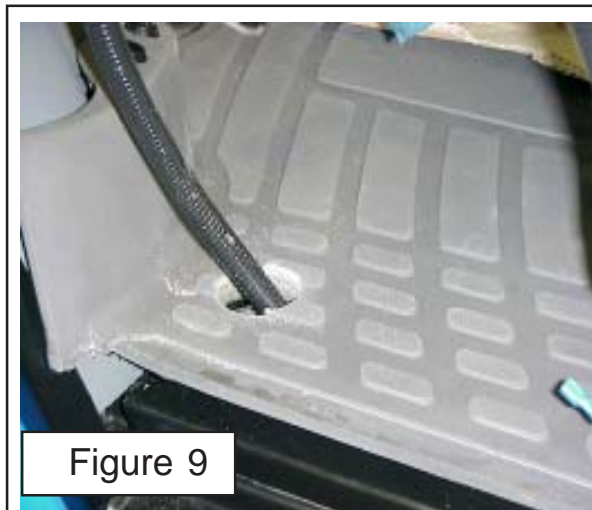
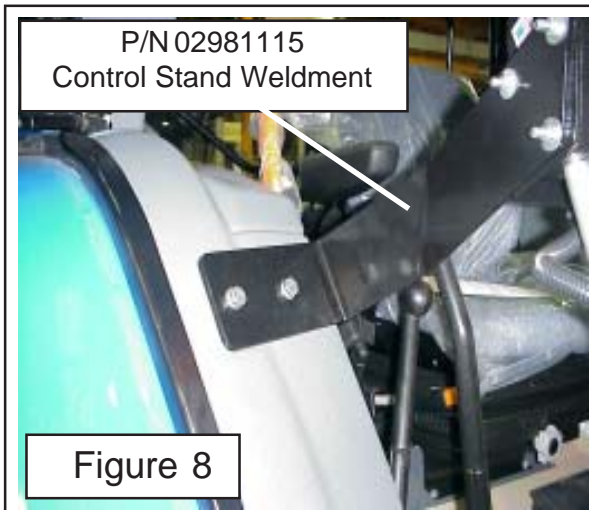
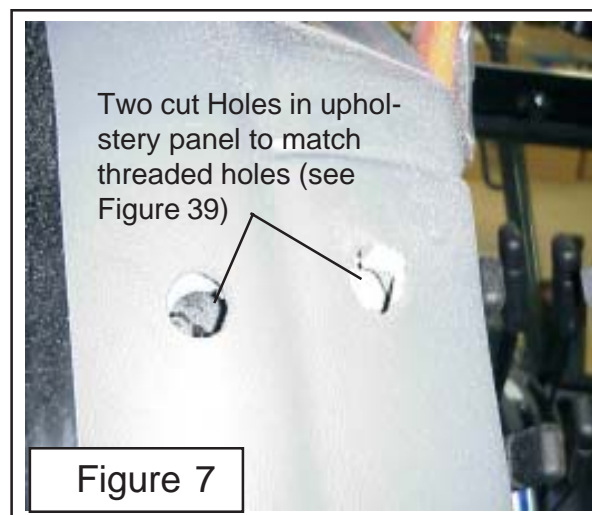
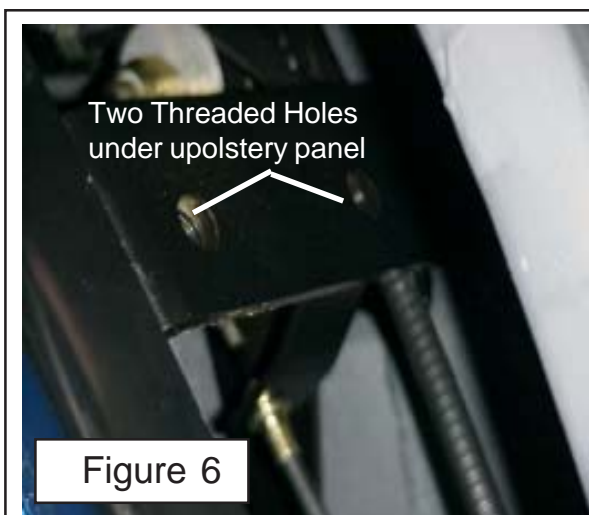
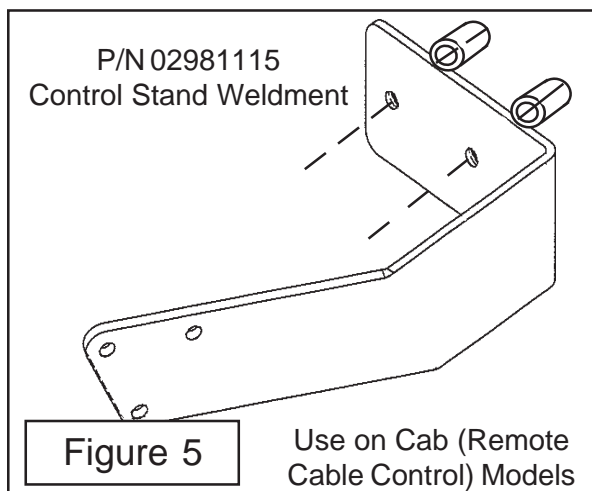
Figure 4

Switchblade (NH-TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA , Asy. Man.) 06 / 05

Control Valve & Valve Controls Installation

3. Cut Hole in Floor Mat for Cables and Electrical Harness to pass through. Cut a hole in the floor mat of cab as shown (See Figure 8). Check under floor to make certain that there is nothing under the floor that can be hit when cutting hole or that will obstruct the cables and wire harness after they are inserted.

4. Install Control valve for Cab Model. The control valve for the cab model bolts onto the hyd tank mount weldment where it bolts to the frame rail (See Figure 10) Insert the cables down through the hole in the floor (See Figure 11) that will have screw down cover over it. Make certain to run the cables through this cover before connecting them at the ends as once the cables are connected they cannot be run through the boot.



Control Valve & Valve Controls Installation

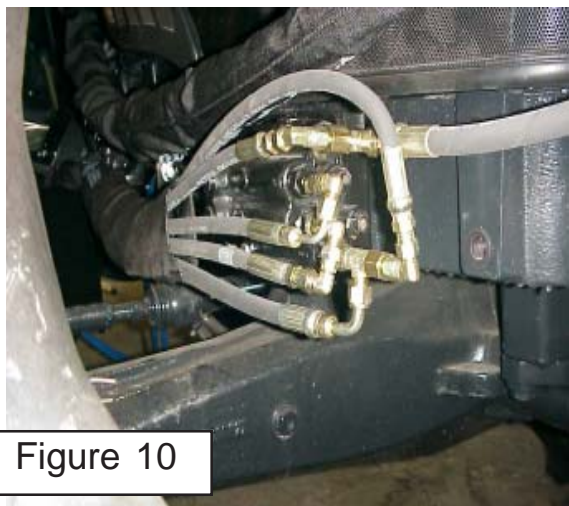


Figure 10

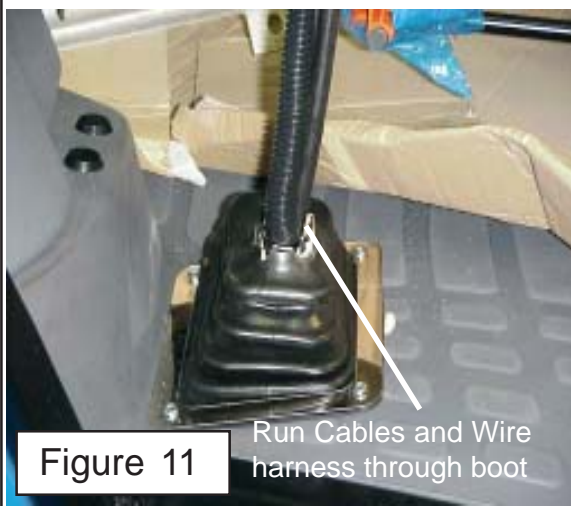


Figure 11

Run Cables and Wire harness through boot

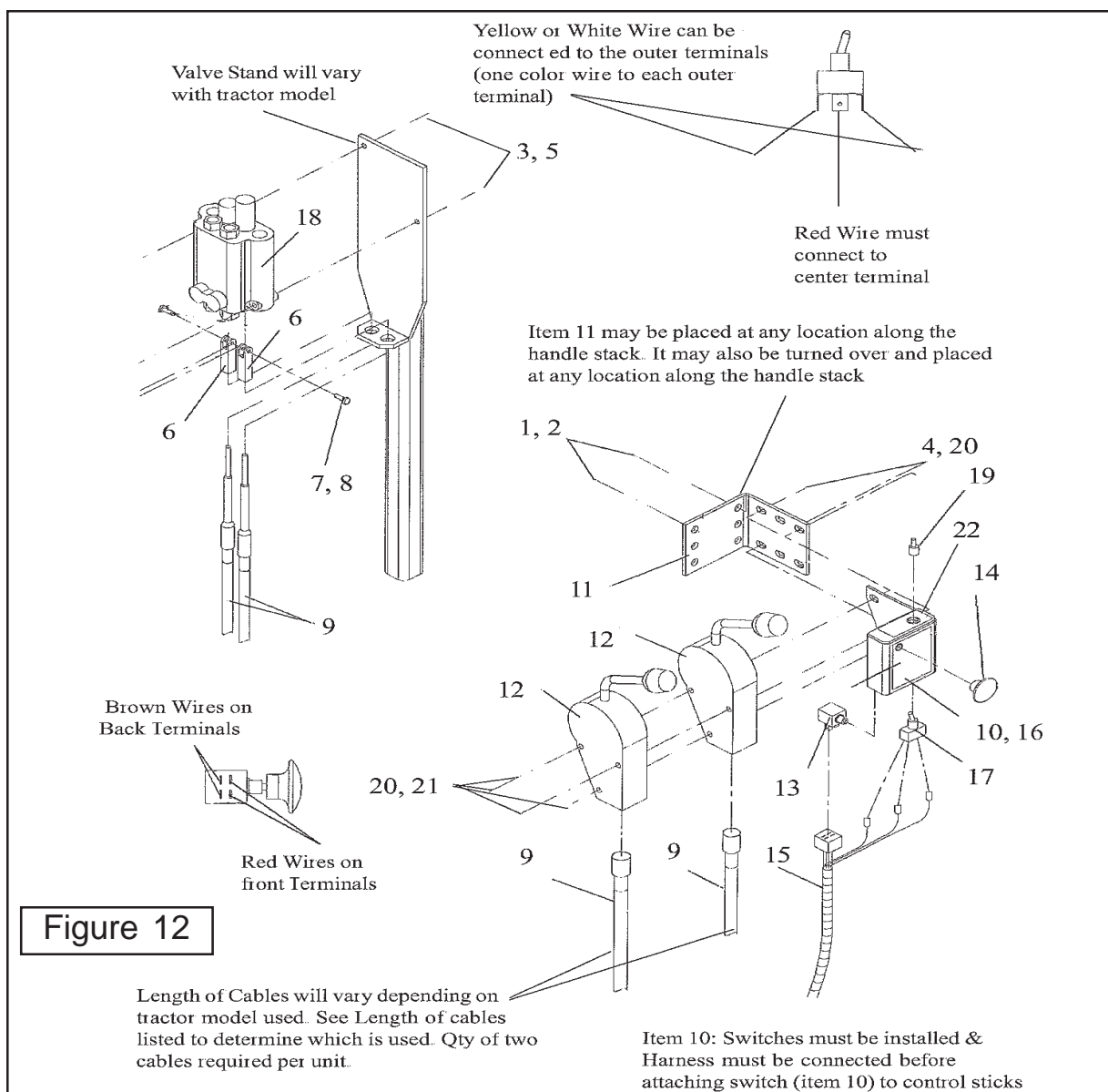


Figure 12

Control Valve & Valve Controls Installation

Item	Part No.	Qty.	Description	Item	Part No.	Qty.	Description
	02982077	--	Valve Asy. W/ Fittings	21.	02976946	1	Cap Asy.
	02974306	--	Valve Asy. W/O Fittings	22.	02976945	4	Spring
1.	02976934	2	Unload Plunger	23.	02966669	1	Spring
2.	02966645	2	Poppet Asy.	24.	02976944	2	Plug Asy.
3.	02966646	1	Spacer	25.	02976943	1	Washer
4.	02976933	2	Spool	26.	02976942	1	Washer
5.	02966648	4	Seat Asy.	27.	02976941	3	Ball
6.	02966649	2	Plug Asy.	28.	02976940	1	Spring
7.	02966650	2	Plug Asy.	29.	02976939	1	Spring
8.	02966651	2	Bushing	30.	02976938	1	Cone
9.	02966652	2	Lockout Spring	31.	02976937	1	Spacer
10.	02966653	1	Cap Asy.	32.	02976936	1	Adapter Cap
11.	02966654	1	Plug Asy.	33.	02976935	A/R	Washer
12.	02976932	1	Body	34.	02966671	2	Wiper Seal
13.	02976931	1	Poppet	35.	02976957	2	Handle Kit
14.	02976930	1	Seat	36.	02968850	2	Adapter, Straight 8MB - 6MJ
15.	02966657	4	O-Ring	37.	03200284	2	Adapter, Straight 6MB - 4MJ
16.	02966658	2	Retaining Ring	38.	02965166	2	Adapter, Tee 6FJX - 6MJ - 6MJ
17.	02966659	A/R	Washer	39.	02982479	2	Adapter, Straight 4MB - 6FJX
18.	02966660	A/R	Washer				
19.	02966661	A/R	Washer				
20.	02966662	1	Washer				

Two Spool Control Valve:

The two spool valve assembly shown (See Figure 13) shows the components that are replaceable in the two spool control valve. Study the drawings, the torque specification if any are listed for figure 12. The fittings are shown in figure 13. When working on valve always clean the exterior of the valve and hoses before disconnecting them. After disconnecting the hoses cap them with clean caps to keep contamination out of hydraulic system. When disassembling the valve make certain the OD of it and all work areas are clean, do not use dirty tools or rags that will leave lint. Only lint free towels (paper or suitable type) can be used to wipe down the hydraulic system. If any components need to be held in the valve body during assembly petroleum jelly can be used. DO NOT Exceed the recommended torque setting listed in figure 12. When removing plug item 11 watch the qty of washers that are removed, this amount is what should be started with when reassembling plug.

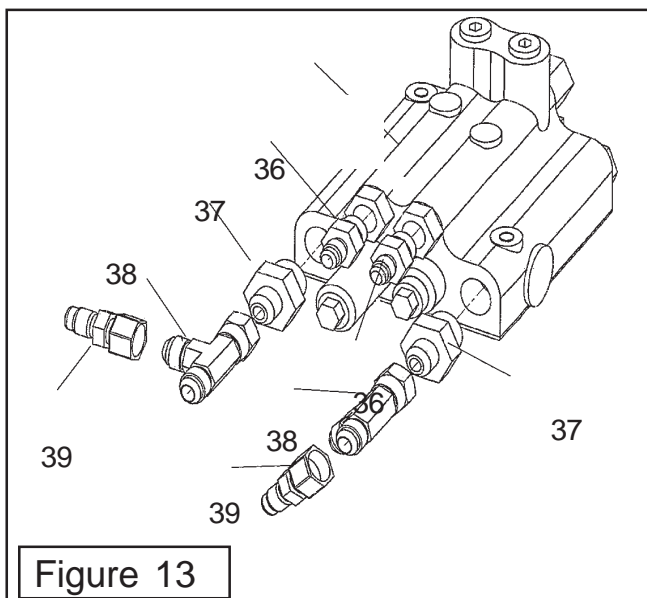


Figure 13

Control Valve & Valve Controls Installation

Control Cable Connection to Control Stick Assemblies:

1. First remove the Cross- Screw from the bottom of the Control Stick Assembly. **DO NOT** remove the screws that fasten the two housings halves together (See Figure 14).

2. Next holding the housing, fully shift the Handle in the Control Stick Assembly to expose the female-threaded end of the Plunger Rod (See Figure 15).

3. Then while holding the Handle to expose the Plunger Rod, thread the Threaded Bead of the Cable into the end of the Plunger Rod and tighten securely. Release the Handle, allowing the Cable to pull into the Control Stick Assembly (See Figure 16)

4. Once Cable is attached to Plunger Rod, move the handle to pull conduit sleeve up and into the control stick assembly (See Figure 17) The Conduit Sleeve has a groove in it that should align with the cross screw (See Figure 17)

5. Reinstall the Cross Screw making certain that the cross screw and conduit sleeve groove are in alignment. Tighten the cross screw securely (See Figure 18)

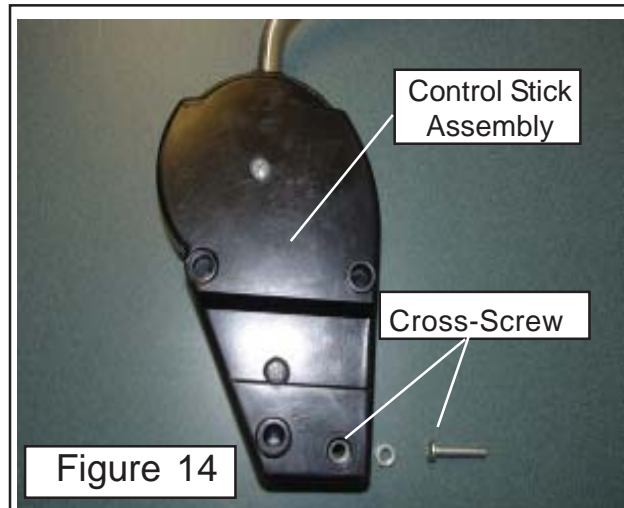


Figure 14

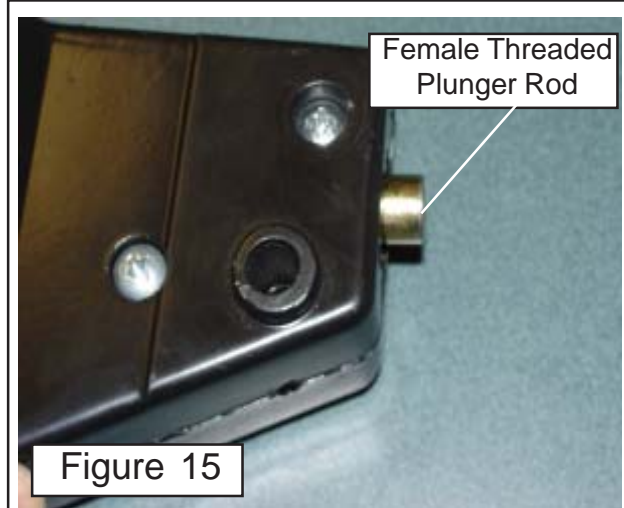


Figure 15

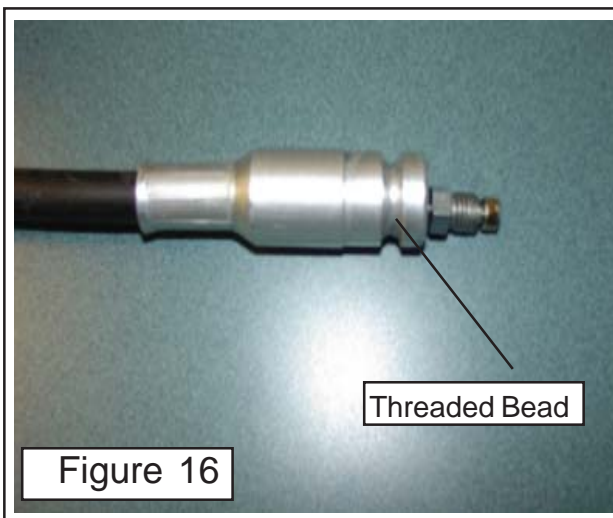


Figure 16

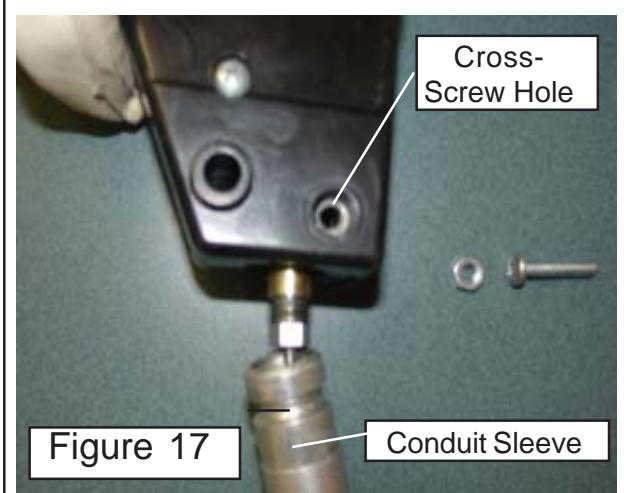
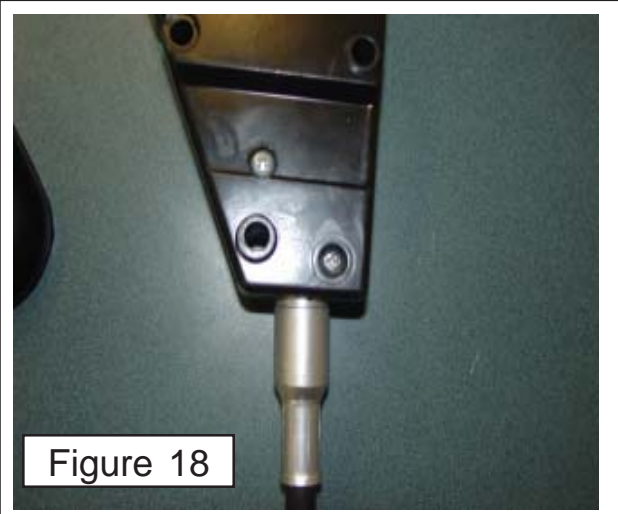


Figure 17

Control Valve & Valve Controls Installation

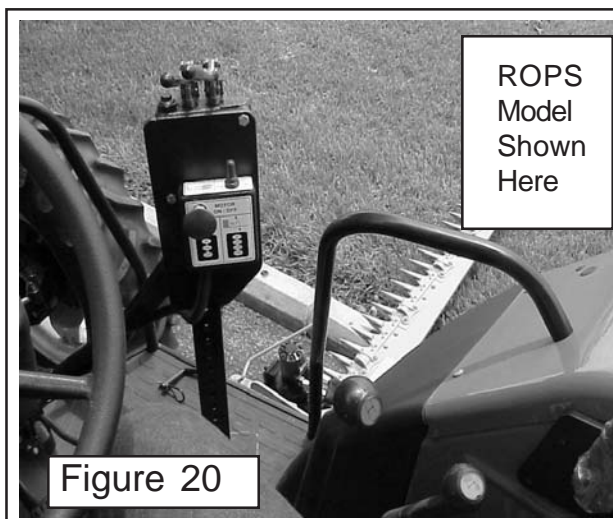
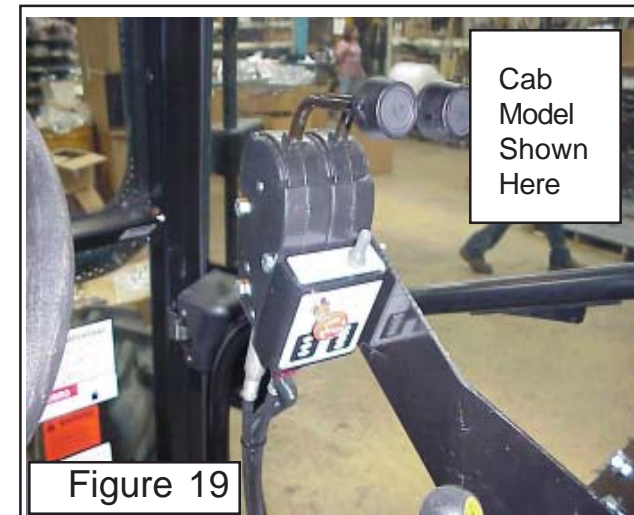
6. There are three holes in the handle assembly that are used to stack the handles on the control handle mount. Install the bolts through the first handle, then the second handle and then through the switch mount plate. Next the three bolts are inserted through the handle mount. (See Figure 18) This is for the cab model (or with remote cable control). The Rops model the valve is mounted to the valve stand and the control handles are connected directly to the valve (See Figure 19). NOTE: Cab models the control handles are installed with the three mounting bolt heads toward operator and the nuts toward the RH Door away from operator (See Figure 21)



7. Install the Operation instruction decal to the valve controls as shown (See Figure 19 & 20)

Push / Pull & Reversing Toggle Switch:

1. The push pull switch mount to the valve stand on non cab tractors (See Figure 20) and to the remote valve control cable handle mount on a cab model (See Figure 19) . On Cab models the switch can be mounted some where else if that is what the customer wanted, however it is recommended that the switch be mounted as shown (See Figure 19 & 20)



Hydraulic Control Valve & Hoses

Control Valve & Hoses:

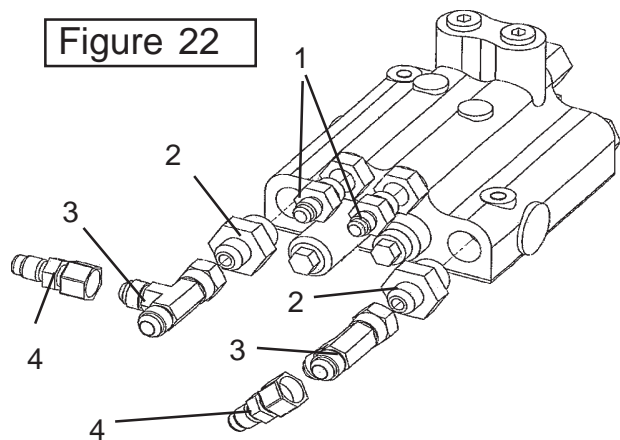
1. The two spool valve assembly shown (See Figure 22) shows the fittings that are used on the two spool control valve. Study the drawing. When working on valve always clean the exterior of the valve and hoses before disconnecting them. After disconnecting the hoses cap them with clean caps to keep contamination out of hydraulic system. When disassembling the valve make certain the OD of it and all work areas are clean, do not use dirty tools or rags that will leave lint. Only lint free towels (paper or suitable type) can be used to wipe down the hydraulic system. If any components need to be held in the valve body during assembly petroleum jelly can be used.

2. When Connecting the hoses to the control valve follow the directions as shown in the hydraulic diagram (See Figure 26). Do not connect hoses backward as this could damage the components.

3. The control handle will connect direct to the valve on ROPS Tractor (See Figure 23), the electric reversing switch and components also connect to the valve mount bracket as shown (See Figure 23).

4. Install The Hose Holder. This will bolt on the RH side of front bolster (See Figure 24 & 25). Looking at the side of the tractor you will see 8 threaded holes, bolt hose holder in the lower hole in second set back from front (16 mm Hole) (See Figure 24 & 25). All hoses will be run through sleeving material, this must be done before they are connected.

Figure 22



Item	Part No.	Qty.	Description
1.	02968850	2	Adapter, Straight 8MB - 6MJ
2.	03200284	2	Adapter, Straight 6MB - 4MJ
3.	02965166	2	Adapter, Tee 6FJX - 6MJ - 6MJ
4.	02982479	2	Adapter, Straight 4MB - 6FJX

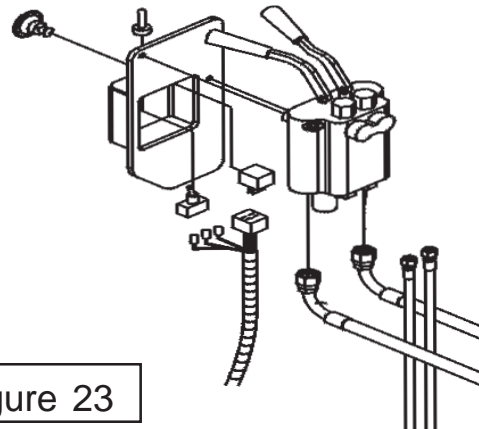


Figure 23



Figure 25

Hydraulic Connections / Hose Routing

5. Install Electrical Switches. The electric neutral safety switch and the head reversing switch both mount into the valve mounting bracket (See Figure 23, and Electrical section in this assembly manual)., Make certain that the battery cables are disconnected before connecting any electrical connections, this is to prevent the shorting of any components. Check the tractors manufactures service /repair manual for any restrictions or special instructions about connecting electric components to the tractor.

Single RH Wing Shown

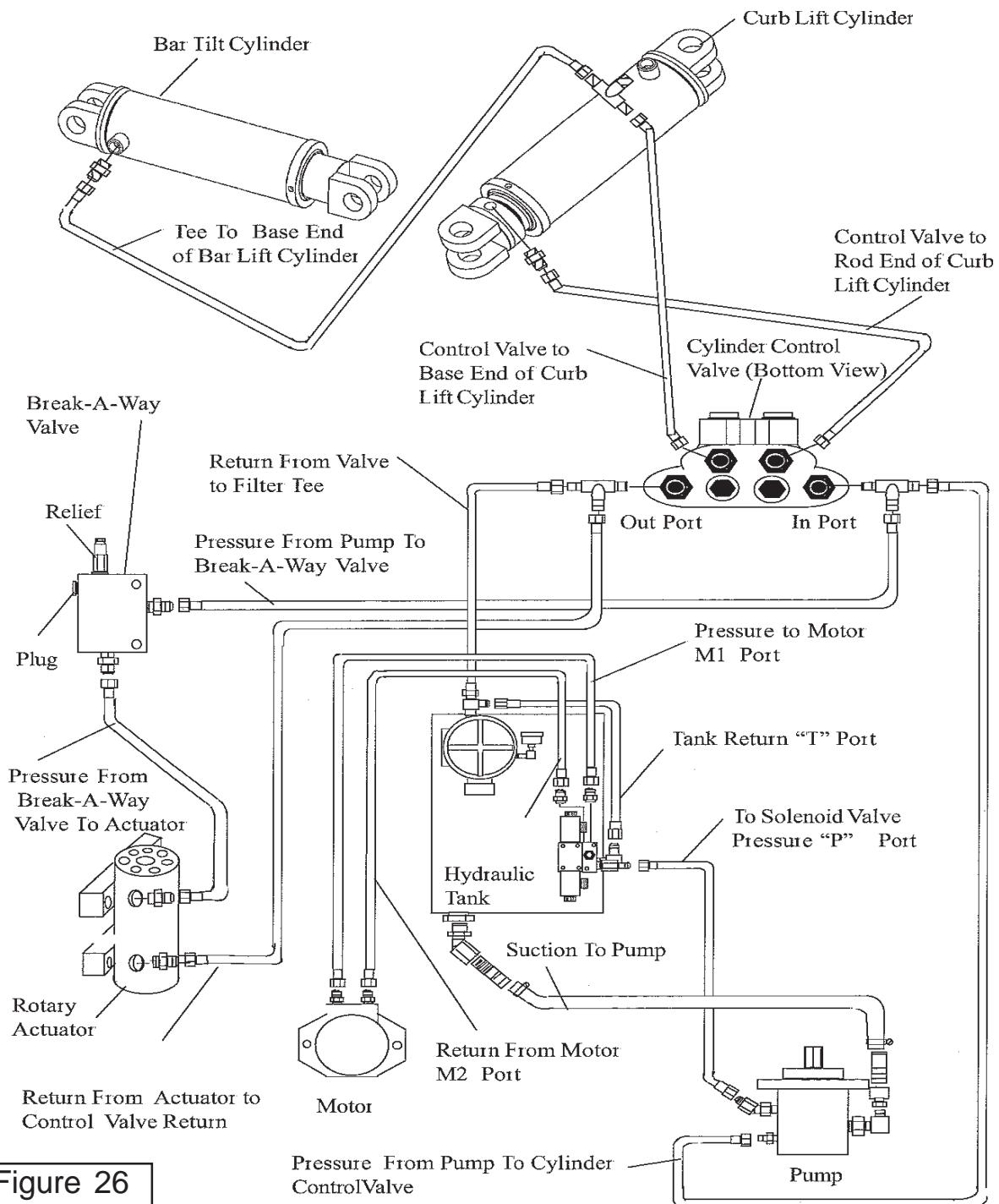
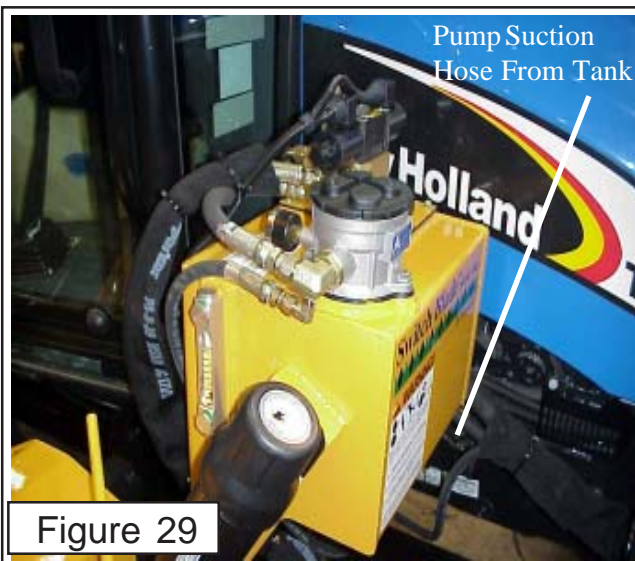
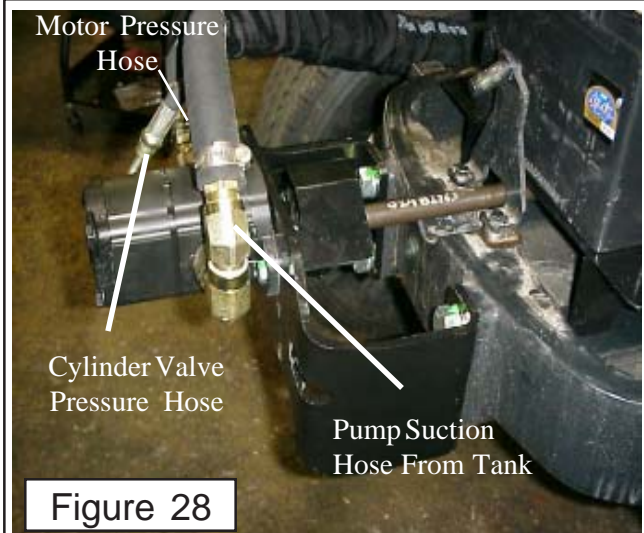
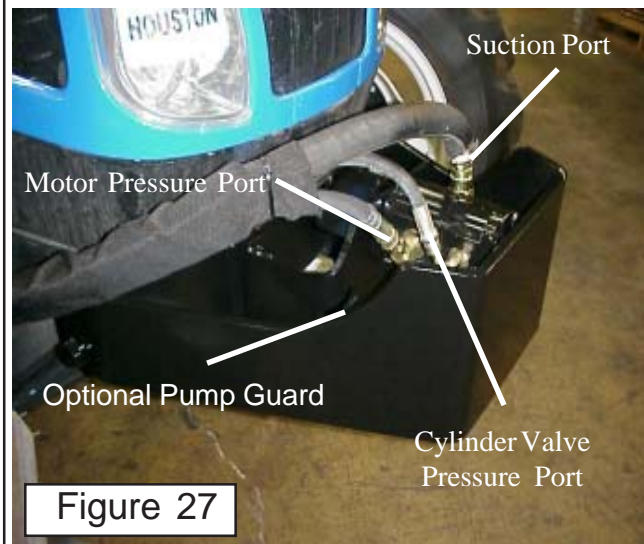


Figure 26

Hydraulic Pump Hose Connection

6. Pump Hose Connections. When connection the hoses to the pump keep all fittings closed and capped until you are ready to connect the hoses. (Figure 27 show the optional pump guard installed, DO NOT install pump guard until after the hoses have been connected will make the connection easier). Leaving hoses and fitting plugged until ready to connect them is to keep contamination out of the system (See Figure 27). When connection the hoses connect the pressure hoses first (See Figure 27). when the pressure hoses are connected to the pump and to the cylinder control valve & the directional control solenoid valve on the tank (See Figure 26, 27 & 28). Connect the Suction hose to the hose bib fitting on the pump (See Figure 28). Use clean hydraulic oil (recommended type and brand only) pour clean oil into the suction hose from the tank end, this will fill the pump with oil and help when pump is started for the first time to not start dry of oil. After filling hose with oil connect the hose to bottom side of the tank (See Figure 29) The motor pressure hose from pump connects to the directional control valve on the tank (See Figure 30).



Fill Hydraulic Tank

Fill Hydraulic Tank with Oil:

1. DO NOT START TRACTOR until you have filled Hydraulic Oil Tank to a level as shown in Sight Glass gauge and fill the Suction Hose to Pump with Oil.
2. Remove Filler Cap. Remove Filler cap only when ready to fill hydraulic Tank with Oil. Do Not leave the Cap off and the system Open, always keep system closed when possible. Avoid any oil contamination. (See Figure 31)
3. Avoid Hydraulic Contamination by filtering the Hydraulic Oil while filling the Hydraulic Tank. Filter buggies or carts are commercially available for Hydraulic system cleanup and Oil transfer. These consist of high capacity filter, a Circulating Pump, a Drive Motor and hoses for connecting to the units hydraulic system. When adding Oil always use Clean new Oil from a sealed container, If you suspect the Oil of being contaminated don't use it. (See Figure 32 & 33). It is best to always use a filter system when adding even new oil.
4. When adding Oil in the field keeping it clean is critical, do not use dirty funnels or hoses. Do Not open Hydraulic tank or any containers unless the openings have been cleaned first. The outside of the containers must be clean. If a windy dusty day do not fill and allow dirt to blow into oil. Always add Oil using a pump system with at least a 10 Micron filter system. (See Figure 34)

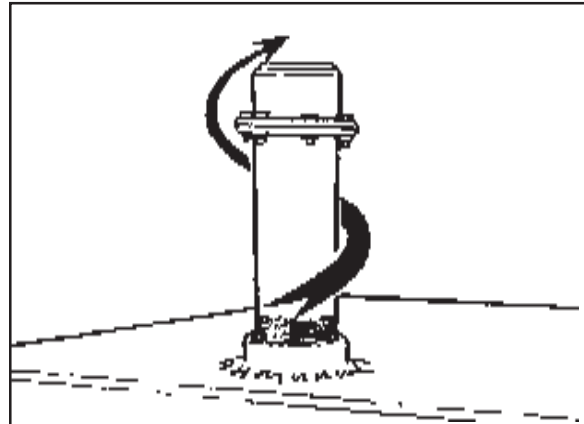


Figure 31

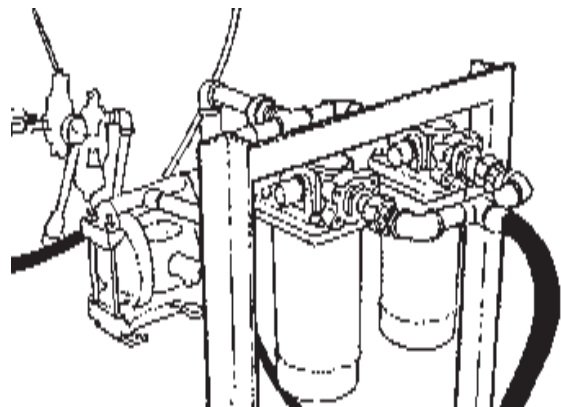


Figure 32

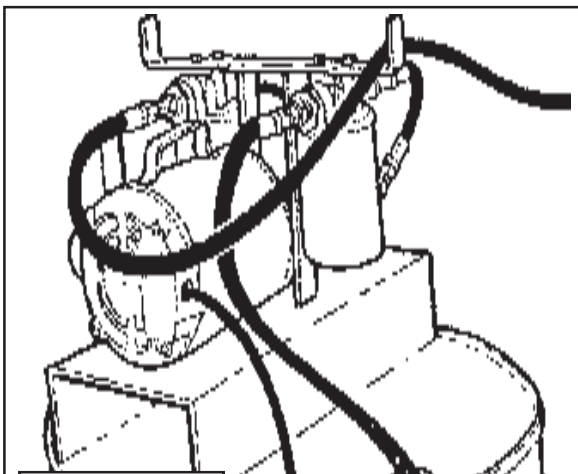


Figure 33

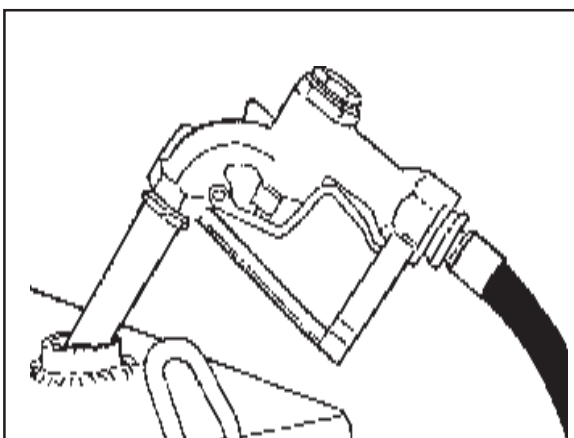


Figure 34

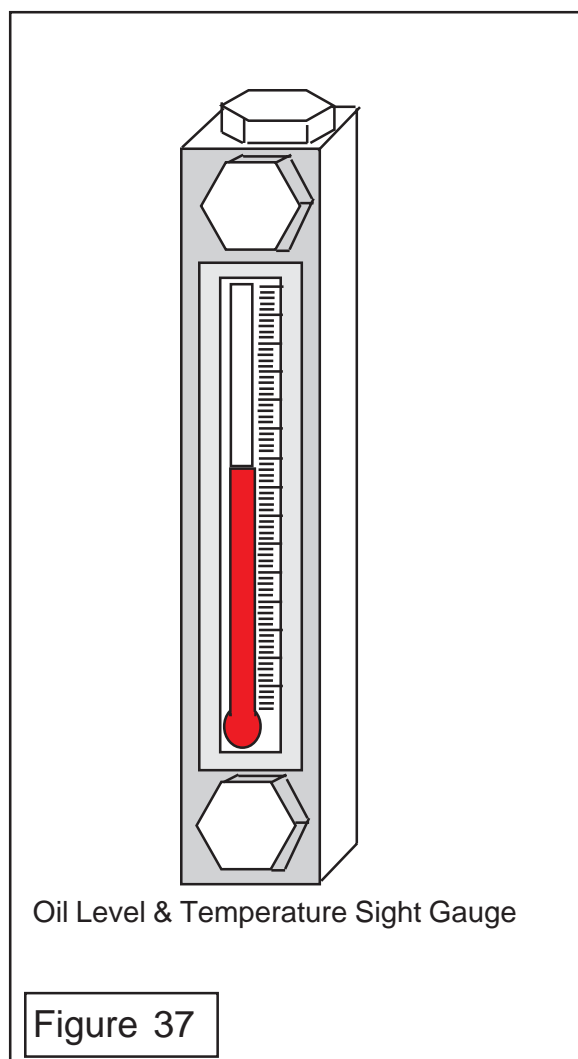
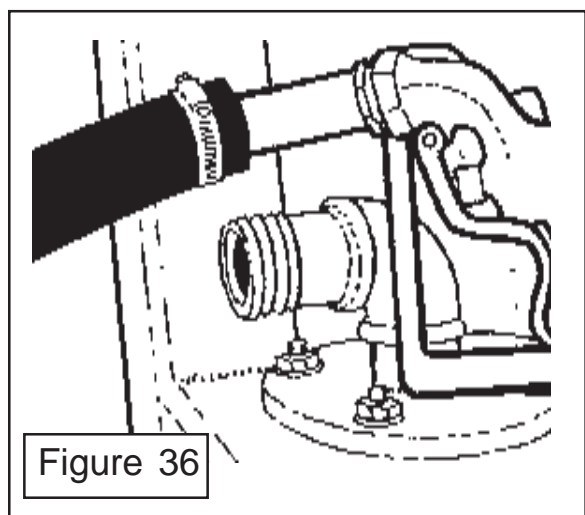
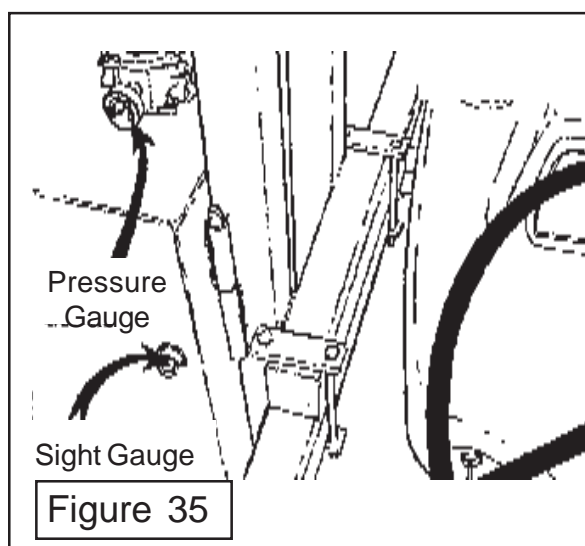
Fill Hydraulic Tank

Fill Hydraulic Tank with Oil:

5. **Fill Tank.** Fill the Hydraulic Tank (**See Figure 37**) Fill tank till the Oil is visible in the sight Gauge (**See Figure 35 & 36**). This will fill tank for the start but it will have to filled again later. Read Step 6 a must.

6. **Fill Suction Hose with Oil.**

This is an important step that must be done. Remove the Suction Hose at the Tank (See Figure 6) and fill the hose with clean oil, THIS IS A MUST DO. The Suction Hose must be filled with Oil to prevent Dry start up of Pump. Dry start up of PUMP can damage the Pump. After filling suction Hose reinstall it and tighten down Hose Clamp.



Section 6

Switchblade

Electrical Connections

New Holland Tractor TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA

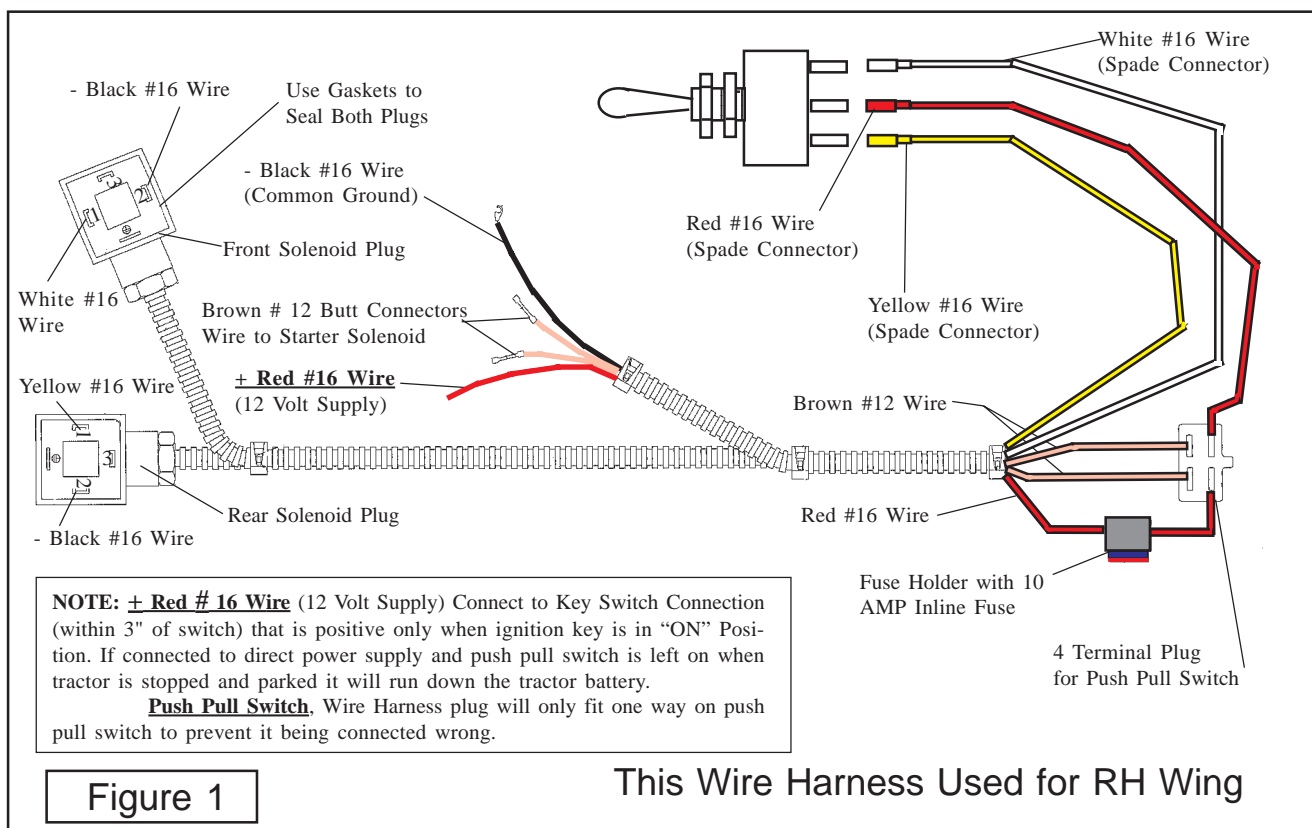
MOTOR - PUMP ELECTRICAL CIRCUIT

Electrical Circuit: RH Wing Mower

The electrical circuit is a pre-assembled wire harness that will control the motor functions. The harness will be used with a push pull off/on switch that prevents the tractor from being started when motor is engaged. The wire harness uses a three position toggle switch that is used to reverse the knife bar direction of travel. These switches are not part of the wire harness assembly, These switches must be connected correctly to operate correctly (See Figure 1). There is a motor control valve mounted on top of the hydraulic tank that will have two electrical solenoids connected to it. The wire harness has two plugs on one end that connects to the solenoids, one plug will have longer wire (also has White Wire) than the other and will connect to the solenoid further most from the cutter bar mount. The other plug with the shorter wire (has Yellow Wire) will connect to the first solenoid closet to the operator.

IMPORTANT NOTICE, READ: The Starter solenoid wires and the 12V power supply wire must be connected to tractor wiring, The power source wire must be connected to a power source that is only charged when the tractors key switch is in the on position. It is nessasary to connect power supply close to ignition switch, (with in 3" of switch). If power supply wire is connected direct to a power source that is charge when ignition switch is off, it will run the tractor battery down. The Solenoid wires (two Brown wires) must be connected close the tractor ignition switch, (within 3" of switch). This is required because some later tractor are using electronic monitoring of the tractor electrical system. If the solenoid wires are connected further down the line the monitoring system may detect this circuit as disconnected and cause the tractor to do different things, from engine shut down to jump out of gear. If you have electrical problems with the tractor doing strange things, check this connection.

When connecting wire harness to toggle switch the red wire MUST connect to the center post of switch, the yellow and the white wire must connect to the two outside post, it will not mater which outside post as long as one each of yellow or white wire is connect to the outer post (See Figure 1).



MOTOR - PUMP ELECTRICAL CIRCUIT

Electrical Circuit: RH Wing Mower

1. Battery Cables Must be disconnected. During the electrical connection process the Battery cables must be disconnected.
2. Tractor Factory Wire Identified. It will be necessary to consult the Tractor manufactures manual to identify the tractor wiring color codes, or you will need to trace the wires to see where they connect. This will be the installers responsibility, Alamo Industrial will not identify any tractor wire colors because of possible change by tractor manufacturer. NOTE: The power (Voltage) Supply for the wire harness must be connected to a source that is disconnected when tractor key switch is in the OFF position. This is to prevent the battery from being drained if the switch for mower are left on when tractor is not on (Shut Down)..
3. Wire Harness. The wire harness is a pre-assembled wire loom (See Figure 1), some of the wires will install inside of the tractor steering column area and some will go out to the Hydraulic Tank. The panel on the side of the tractor steering column will need to be removed (Consult tractor manufacture manuals for procedure to remove panel). The floor pad will have the cable run through it next to the control cables on cab model and alone on the ROPS model (See Figure 3). The wire harness must be run through the Boot Cover (See Figure 4) before the wires are connected,
4. Electrical Control Selector Valve. At the tank the connections of the wire harness are connected to the electrical motor reversing control valve (See Figure 6). Make certain to tie the wire harness out of the way so it will not be damaged by other components.

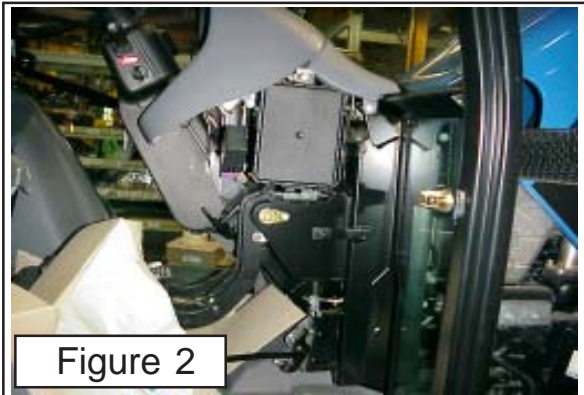


Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

Switchblade (NH-TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA , Asy. Man.) 06 / 05

NOTES

Section 7

Switchblade

Mechanical Repairs & Adjustments

New Holland Tractor TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA

This Section is for the adjustment of the cutter bar / Knives if needed after assembly, the unit is assembled when shipped but because of some disassembly for shipping some adjustments may be required when re-assembled.

CUTTER BAR ADJUSTMENTS

Lead Adjustment:

The lead angle is how far the outer end of the cutter bar runs forward of the inner end.

The lead angle of the cutter bar is preset at the factory at 3/6" per foot. The lead may be changed if desired. To reduce the lead, move the washers from the outside of the cutterbar support plate in between the rubber strike pad and plate (See Figure 3).

Pitch Adjustment:

The Pitch angle is the level of the cutter bar front to rear or what angle the blade is to level front to rear. Different cutting conditions allow you to change the pitch of the knife by + 15° to - 15° or level.

The pitch is set by loosening the three mounting bolts that connects the skid shoe / Break-A-Way assembly to the carriage arm assembly (See Figure 4 & 4A). The two lower bolts holes are slotted, this will allow the cutter bat to be tipped up +15° or down -15° in front. Set Pitch at what works best for your application.

Cutter Bar Alignment:

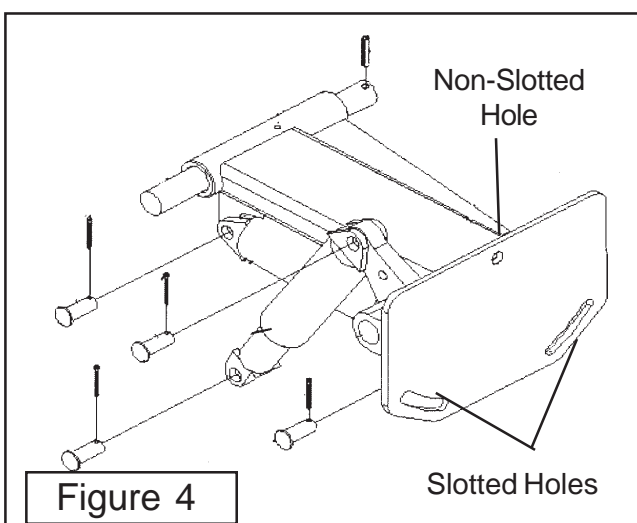
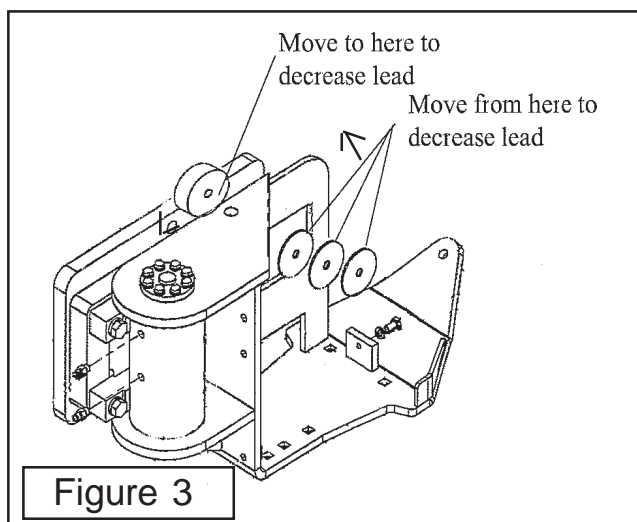
All cutting is done by the knife passing over ledger plate in the guard. It is vital that these sections are parallel with the plates and in contact with them, (See Figure 5 & 6).

The knife should move smoothly in the cutterbar guides and every knife section should rest on the ledger plate to make a shear cut. This means the guards, ledger plate, wear plates, clip and knife head caps must be in good condition and correctly set. If these parts become loose or worn, the knife will flop around in the cutter bar, chewing and tearing instead of cutting.

Guard Adjustment:

1. To align the guards, the only method provided to accomplish this very important adjustment is to bend the guards into alignment with a hammer. No easier method has been found to adjust heavy duty guards which will stand up in rocky conditions.

Continued Next Page



CUTTER BAR ADJUSTMENTS

Note: Guards are cast from alloy steel. If they are worked to much, they will harden and cannot be bent. In this case remove the guard from the bar and remove the ledger plate. Heat the guard to a cherry red and cool. This process will anneal the guard enough that it can be bent.

2. Raise the bar to about 45°. Make certain the knife is at the full retracted position of the stroke so the flywheel doesn't suddenly turn and catch your fingers in the knife. A pair of Vise Grip Pliers gripped tightly to the knife on the upper side of the rock guard will allow extra protection against cutter bar from turning. Make certain the Tractor is secured so it cannot be started until you are the one who decides to start it when the job is finished, all tools removed and cleaned up and it is safe to do so. Make certain tractor parking brake is set.

3. Sight down the bar and look for a knife section in close contact with a guard ledger. If the section to the right and left are both 1/8" of the ledger do not bend the two sides up until they contact the knife. This is wrong (see Figure 5), the high guard should be knocked down until all three contact. The higher up a guard gets bent, the more the knife section will tend to contact only the tip (See Figure 5 & 6).

4. Bolt the guards tight and strike them in the thick part, just in front of the ledger plates (see Figure 6). Do not pound down the guard lips as the knife might bind. Retighten the bolts as each guard is aligned. Disregard the position of the guard points. It is the ledger plate which must be kept in line. Blunt points should be filed sharp.

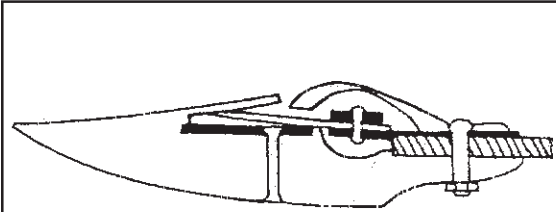
5. Start from the inner shoe, adjust each guard so that the knife section and ledger are parallel and reasonably close to each other. Find the high guard and knock them down. Usually, the only time it is necessary to knock a guard up is when new guards are first installed on the bar.

6. Make certain that the first knife section is contacting the inner shoe ledger plate. If it doesn't contact, check the first or second guard which may be holding the knife up or the inner shoe ledger plate may be worn out.

7. Finally, align the industrial outer shoe in the same way as the guards. (See Figure 5 & 6 and step 1 through 6)

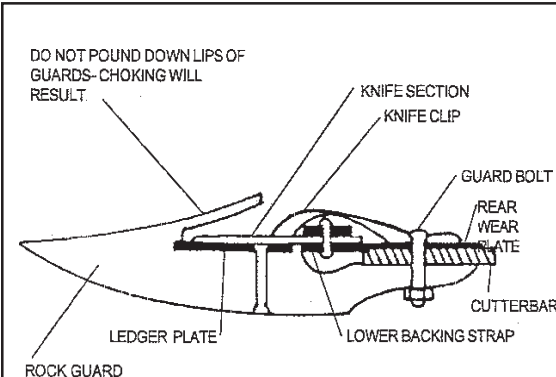
Wear Plates::

The wear plates must line up with each other to give the knife back straight bearing along its entire length. Wear plates should project approximately 1/16" in front of the leading edge of the cutterbar after adjustment. Alamo Industrial wear plates are hardened on both edges. After the first edge has worn back, simply turn over the plate to obtain a new wearing surface.



WRONG

Figure 5



RIGHT

Figure 6

CUTTER BAR ADJUSTMENTS

Clips:

After all guards are adjusted, it is necessary to see that the knife clips are bent down to within 1/64" of the section. The easiest way to check this is to hold the knife down on the ledger plate and use a feeler gauge or the cover of a paper match book to measure the clearance. Do not attempt to hold the tightly against the ledger plate with the clips. Knock the clips down with a hammer. A light blow with hammer is all that is required. If the clips drag on the knife, pry them up. Drag will bind the knife and wear the clip very rapidly (See Figure 7 & 8).

Knife Repair:

ALWAYS USE A SHARP KNIFE. A dull knife cuts poorly, may plug and doesn't do a clean job. Keep the knife straight with the sections firmly riveted to the knife back. When sharpening knife, be careful to restore the original shear angle and bevel of 23°. Properly and improperly ground knife sections are shown (See Figure 9). A knife section that has been ground several times may have the proper angle and bevel and still be unserviceable because the hard cutting edge has been ground away and the section is too short to cut everything encountered.

Knife Replacement:

Replace worn or broken knife sections. Alamo Industrial knife sections are heavy duty sections made of special steel and will stay sharp for many more hours than conventional sections.

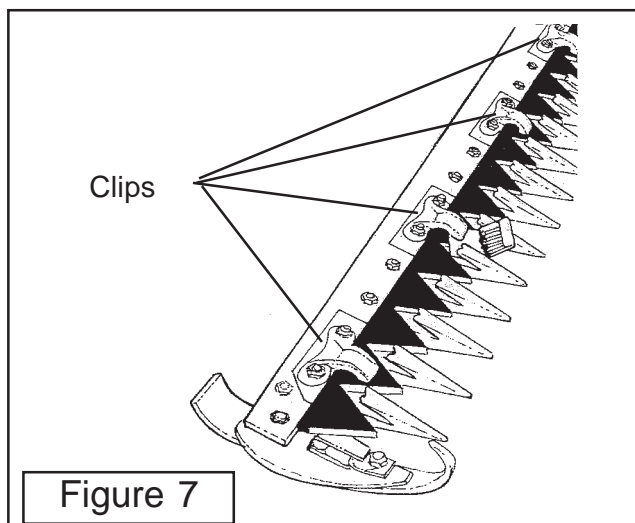


Figure 7

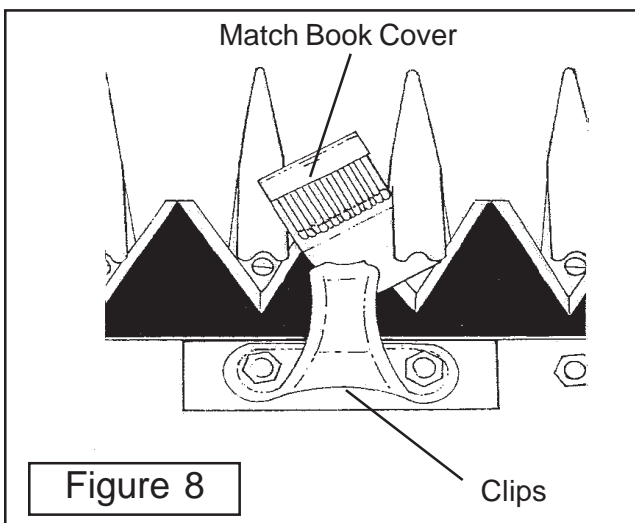
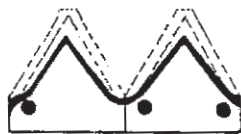


Figure 8



New Sections - proper bevel and angle for good work.



Improperly ground sections - narrow bevel and wrong angle which changes the angle of shear.



properly ground sections even after repeated grinding, proper bevel and angle are retained.



Sections ground off center, destroying the register of blade in guard.

Figure 9

CUTTER BAR REPLACEMENT

Cutter Bar Assembly Replacement:

Replacement of the complete cutter bar assembly will require the cutter bar assembly to be unbolted from skid shoe / break-a-way assembly. Wear gloves as the knives on the cutter bar can be very sharp and can cut you. (See Figure 10)

It will not be require to remove any of the hydraulic hoses or even take them loose. Looking down at the planetary drive (and Hydraulic Motor Assembly) there are four nuts in the plate that is attached to the drive assembly. Remove these four nuts, if you want to remove the four carriage bolts the skid shoe will have to be unbolted and removed. When lifting the drive assembly up and away from the cutter bar take notice of the four tube spacers under the drive assembly, there are two different length of the spacers. The short ones go to the rear and the long ones go to the front. Once the drive assembly has been lifted off you will see a nylon bearing in the knife bar head clamp, it should have stayed in the clamp.

There will be two more bolts connecting cutter bar to break-a-way assembly once these nuts are removed the cutter bar should lift up over the bolts if they were left in. There will be a square plate under the cutter bar that has 4 holes in it, make certain to note this for reassembly

When reinstalling cutter bar reverse the disassembly procedures. Make certain the nylon bearing is in good condition or replaced, sometimes the clamp will have to be loosened to get the nylon bushing installed into clamp and the drive stud that is attached to the drive assembly with two socket head bolts, DO NOT tighten clamp bolt now. This drive stud can be unbolted from drive assembly, inserted into nylon bearing and re-bolted to drive assembly later.

The nuts on the carriage bolts (4 short and 2 long 3/4" carriage bolts) that retain the drive assembly and the cutter bar to the break-a-way assembly must be torqued to 85 ft. lbs.

After the assembly is finished the guards, clips and ledger must be checked, see the previous section in this manual for setting cutter bar components.

Tighten the clamp bolt around the drive stud, use a good thread lock compound on clamp bolt and tighten the clamp bolt until the up & and down movement of clamp on drive stud is removed. DO OVER TIGHTEN the clamp bolt as the drive stud has a bearing inside that will be damaged.

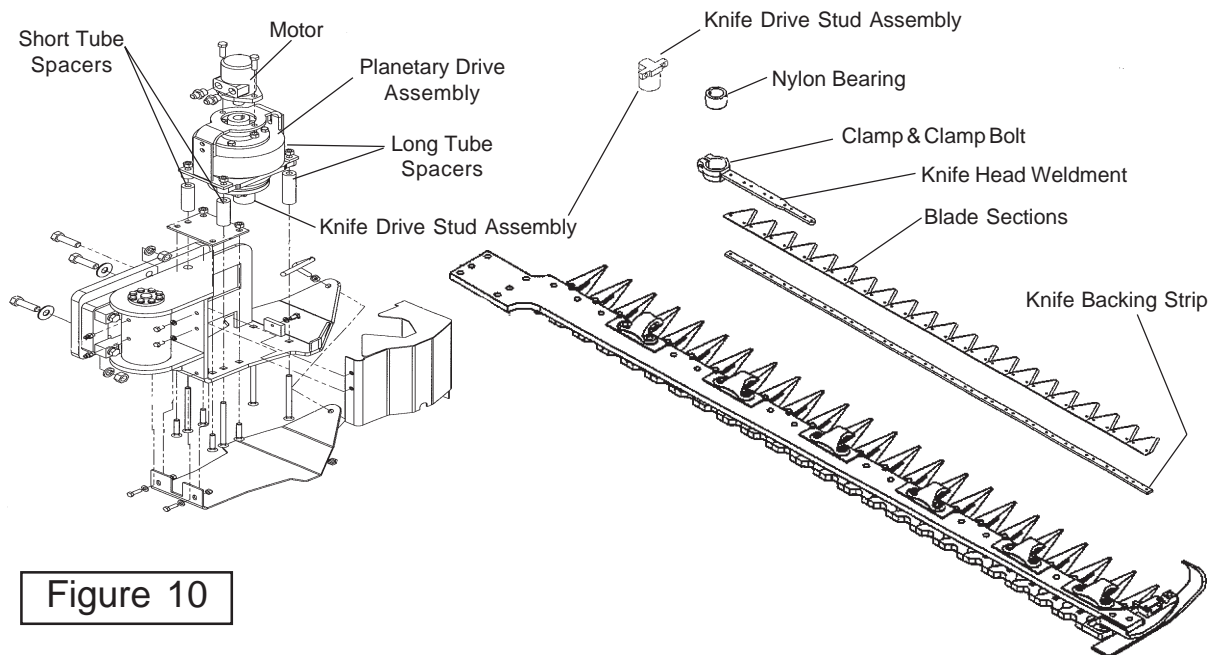


Figure 10

KNIFE BAR REPLACEMENT

Knife Bar Replacement:

Replace the Knife Bar assembly will require the cutter bar assembly to be unbolted from skid shoe / break-a-way assembly. Wear gloves as the knives on the cutter bar can be very sharp and can cut you. (See Figure 10 & 11)

It will not be require to remove any of the hydraulic hoses or even take them loose. Looking down at the planetary drive (and Hydraulic Pump Assembly) there are four nuts in the plate that is attached to the drive assembly. Remove these four nuts, if you want to remove the four carriage bolts the skid shoe will have to unbolted and removed. When lifting the drive assembly up and away from the cutter bar take notice of the four tube spacers under the drive assembly, there are two different length of the spacers. The short ones go to the rear and the long ones go to the front. Once the drive assembly has been lifted off you will see a nylon bearing in the knife bar head clamp, it should have stayed in the clamp.

There will be two more bolts connecting cutter bar to break-a-way assembly once these nuts are removed the cutter bar should lift up over the bolts if they were left in. There will be a square plate under the cutter bar that has 6 holes in it, make certain to note this for reassembly.

Use caution the knife bar can be very sharp, it is recommended that you wear gloves to protect your hands. The Knife Bar will slide out at the drive end, if it will not slide out then something is wrong. Check the rock guards, clips and other components to see where it is to tight. The easiest way if any of these make it to tight is to unbolt them and remove them for now. The new or repaired knife bar will install the same way, it will slide in from the drive end under clips and between rock guards. DO NOT use hammer or force to install knife bar, if it will not slide in find out why because if the bar is forced in it will be damaged or other component will be damages. The Knife bar and cutter bar can not operate fitting tightly together they will bind causing damage..

When reinstalling cutter bar reverse the disassembly procedures. Make certain the nylon bearing is in good condition or replaced, sometimes the clamp will have to be loosened to get the nylon bushing installed into clamp and the drive stud that is attached to the drive assembly with two socket head bolts, DO NOT tighten the clamp bolt at this time. This drive stud can be unbolted from drive assembly, inserted into nylon bearing and re-bolted to drive assembly later (See Figure 10 & 11). if the drive stud is removed from the drive assembly when you reinstall it the two socket head bolts will need to be torqued to 35 ft. lbs.

The nuts on the carriage bolts (4 short and 2 long 3/4" carriage bolts) that retain the drive assembly and the cutter bar to the break-a-way assembly must be torqued to 85 ft. lbs.

Tighten the clamp bolt around the drive stud, use a good thread lock compound on clamp bolt and tighten the clamp bolt until the up & and down movement of clamp on drive stud is removed. DO OVER TIGHTEN the clamp bolt as the drive stud has a bearing inside that will be damaged.

After the assembly is finished the guards, clips and ledger must be checked for clearance, see the previous section in this manual for setting knife bar to cutter bar components (See Figure 10 & 11).

The skid shoe will be the last item reinstalled. Make certain the rod deflector which bolts to the front of the skid shoe is pointed correctly.

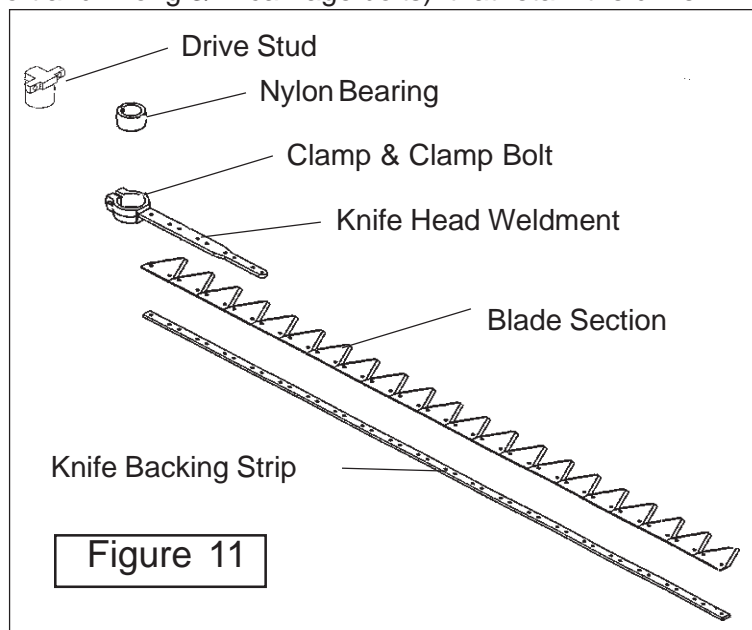


Figure 11

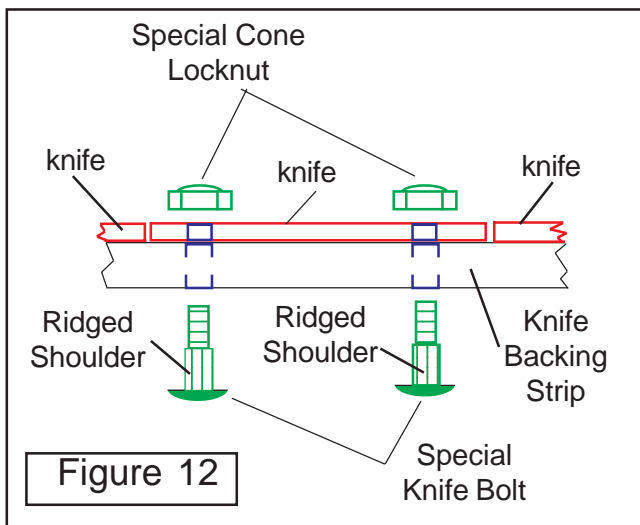
KNIFE REPLACEMENT

Knife Replacement:

The Knives are very sharp, use gloves and caution when working with these knives. Secure tractor so that it cannot be started until you are ready for it to. Set the parking brake on the tractor. Make certain cutter bar is completely on the down stroke, this will prevent the cutter bar from moving down ward. Also the Knives can be locked with a clamp so it cannot move unless you want it to. If cutter bar needs to move the best way is by using a punch in one of the holes on the flywheel, remove clamp the replace it after you have moved the cutterbar.

To remove the old knife the Knife retaining bolt will have to be removed, usually these bolts cannot be used again and it is recommended that new one be used when changing knives. When lock nut is removed the bolt should not fall out as the shoulder of the bolted is ridged to make a drive in fit. Drive the bolt out from the top, there are two bolts per knife. There are two different length of these bolts, the majority is 5/8" long. The first 7 bolts which also bolt the knife section, knife backing strip and the knife head weldment together is longer, 1-1/64" long. Remove the locknut, if the lock nut cannot be removed these bolts can be cut with a chisel under the lock nut and the bolt driven out from the top, use caution and not drive a punch or anything through the hole that is larger than the bolt as it will damage the hole in the knife backing plate.

Replace a Knife or a group of knives. The knife can be changed without disassembly of the cutter bar. The Knife retaining bolt is a special ridged shouldered bolt, this makes the bolt have a wedged fit into the knife backing strip. The special bolt will need to be driven into the knife backing strip from the bottom until the head of bolt bottoms out on the knife backing strip. Install the new cone locknut and snugly secure the bolt, do not over tighten these bolts as they are 1/4" gr. 5 and will twist off. Torque 9 to 10 ft. lbs max. If all the rock guards and clips were adjusted right to begin with they should not have changed, but check them for alignment to make certain. If the rock guards and clips need to be adjusted go back to the guard adjustment section earlier in the manual. (See Figure 11, 12, 13 & 14)



OUTER SHOE ASSEMBLY REPLACEMENT

Outer Shoe Assembly Replacement:

The outer shoe assembly bolts to the last two holes in the cutterbar. There are two different length bolts used here because the last bolt will also mount the outer shoe sole to the outer shoe assembly.

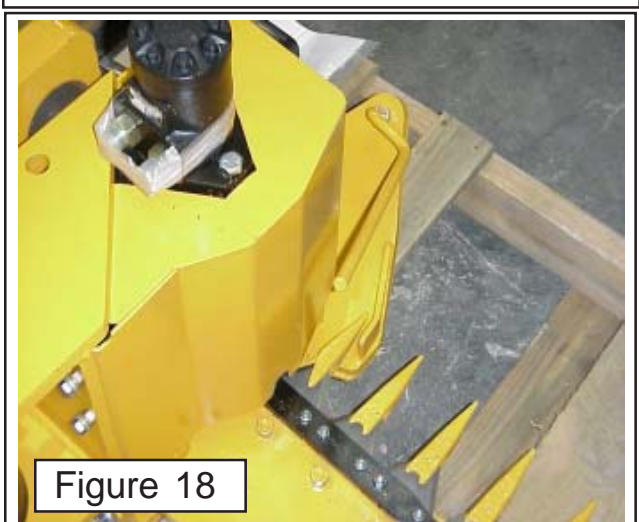
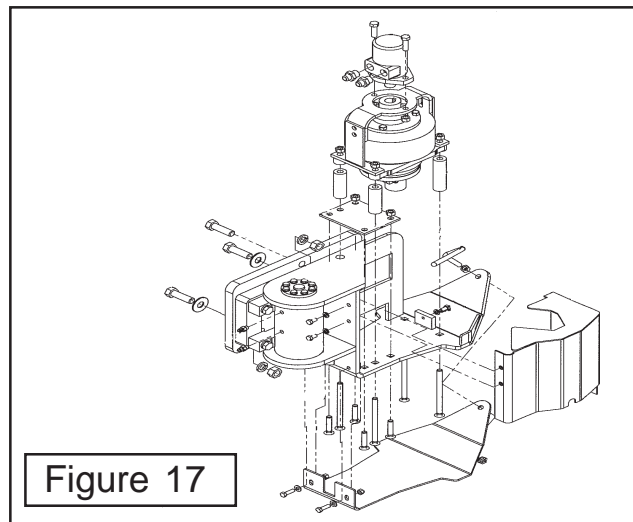
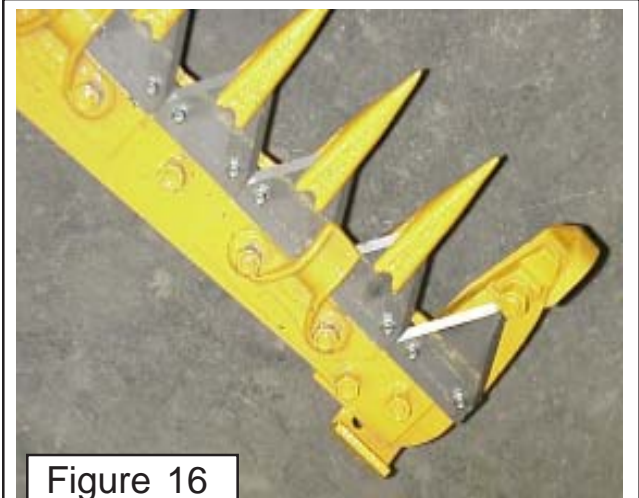
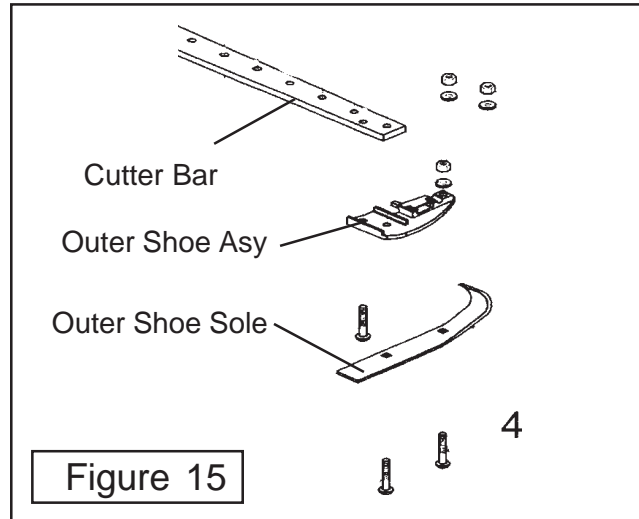
These are 7/16" grade 5 carriage bolts and will torque 45 to 50 ft. lbs. The outer shoe sole is a replaceable wear item and be replaced as needed without disassembly of the cutterbar (See Figure 15 & 16).

Inner Shoe Replacement:

The inner shoe bolts to the Break-a-way assembly using two bolts in the rear and the rod deflector in the front. There is also a motor cover weldment that bolts over the motor and drive assembly that is bolted on with three bolts (See Figure 17 & 18).

Rock Guard, Clip & Wear Plate Replacement:

The rock guards, clip and wearplates can be replaced without removing that cutterbar or knife bar assembly. They are bolt on items that can be bolted one at a time for repair or they can all be replaced all at the same time. Anytime the guards, clips or wearplates are replaced they will have to be checked to make certain they are fitting correctly. See the guard, clip and wearplate adjustment section on previous pages. The bolts mounting rock guards are 7/16" grade 5 plow bolts and will torque 45 to 50 ft. lbs (See Figure 16)



INNER SHOE WELDMENT REPLACEMENT

Inner Shoe Weldment Replacement:

The Inner Shoe Weldment replacement will require other components to be removed in order to replace the weldment. Removal or disconnection of hydraulic line will not be required. DO NOT Start tractor after this repair has began, secure tractor from starting and set parking brake on tractor.

1. Inner Skid Shoe Plate will have to be removed, See inner shoe replacement on previous page (See Figure 17 & 18).

2. Drive Assembly will need to be removed, See cutter bar assembly replacement on previous pages (See Figure 10).

3. Cutter Bar Assembly will need to be removed, See cutter bar assembly replacement (See Figure 10).

4. The Rotor Actuator is a hydraulic operated break-a-way unit. Before starting repair put a drain pan under rotor actuator. The hoses at the actuator should be loosen slowly, but NOT Removed to relieve pressure in lines and actuator. Make certain that it is the hose at the actuator and not the control or the relief valve block. After the pressure if any has been relieved the hoses can be retightened. This is important DO NOT try to unbolt Actuator Pin or any other frame component until the hoses have had the pressure relieved. (See Figure 19, 20 & 21)

5. The Skid Shoe weldment can be removed with the Rotor Actuator attached to skid shoe weldment and then removed or it can be left bolted to Back Pivot Plate. The rotor actuator is not part of the skid shoe weldment. To remove the actuator from skid shoe remove the 8 bolts that retain break-a-way rotor actuator pin. The rotor Actuator pin goes all the way through the shoe weldment and can be removed by pushing up on pin from bottom (See Figure 19, 20 & 21) 6. The Back Plate is retained by 3 bolts which mount it to the Carriage Arm, It is not required to remove the Back Pivot Plate to remove skid show weldment. It must removed, remove the three retaining bolts to drop the back plate.



Figure 19

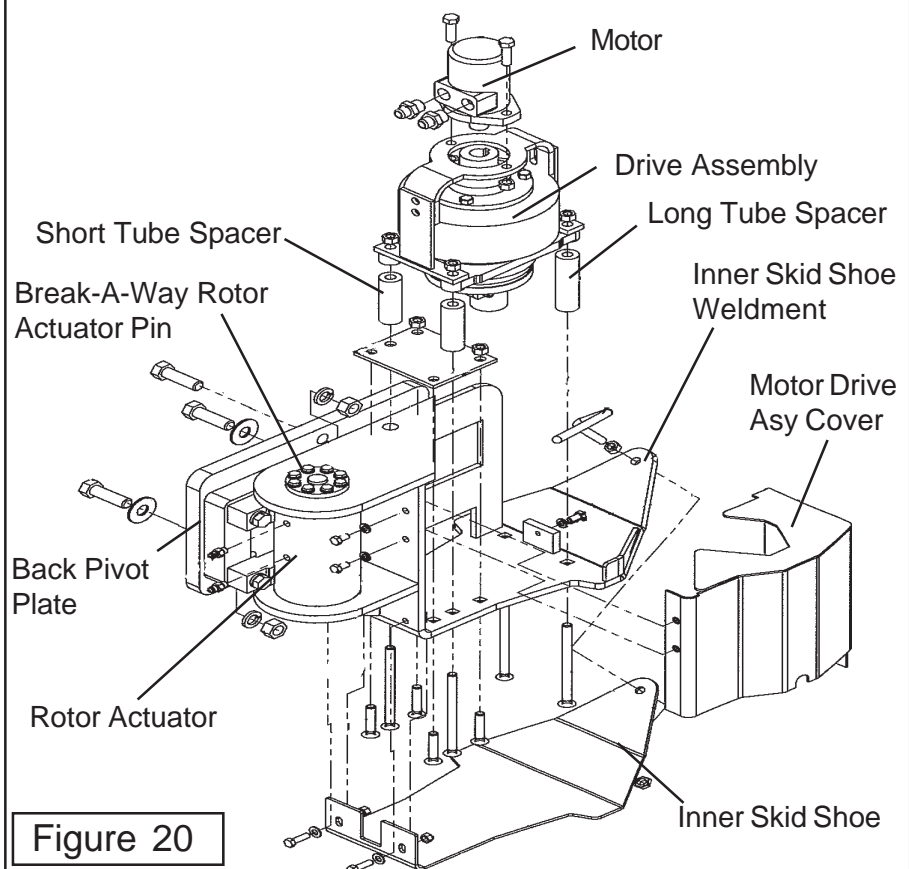
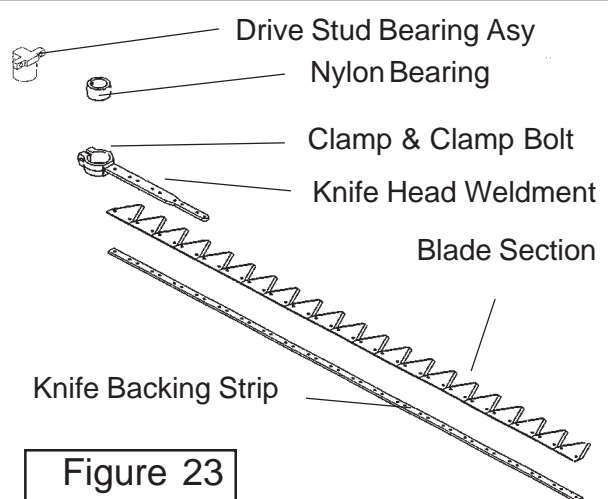
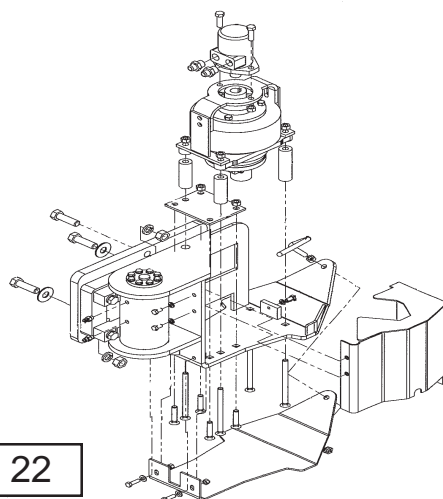
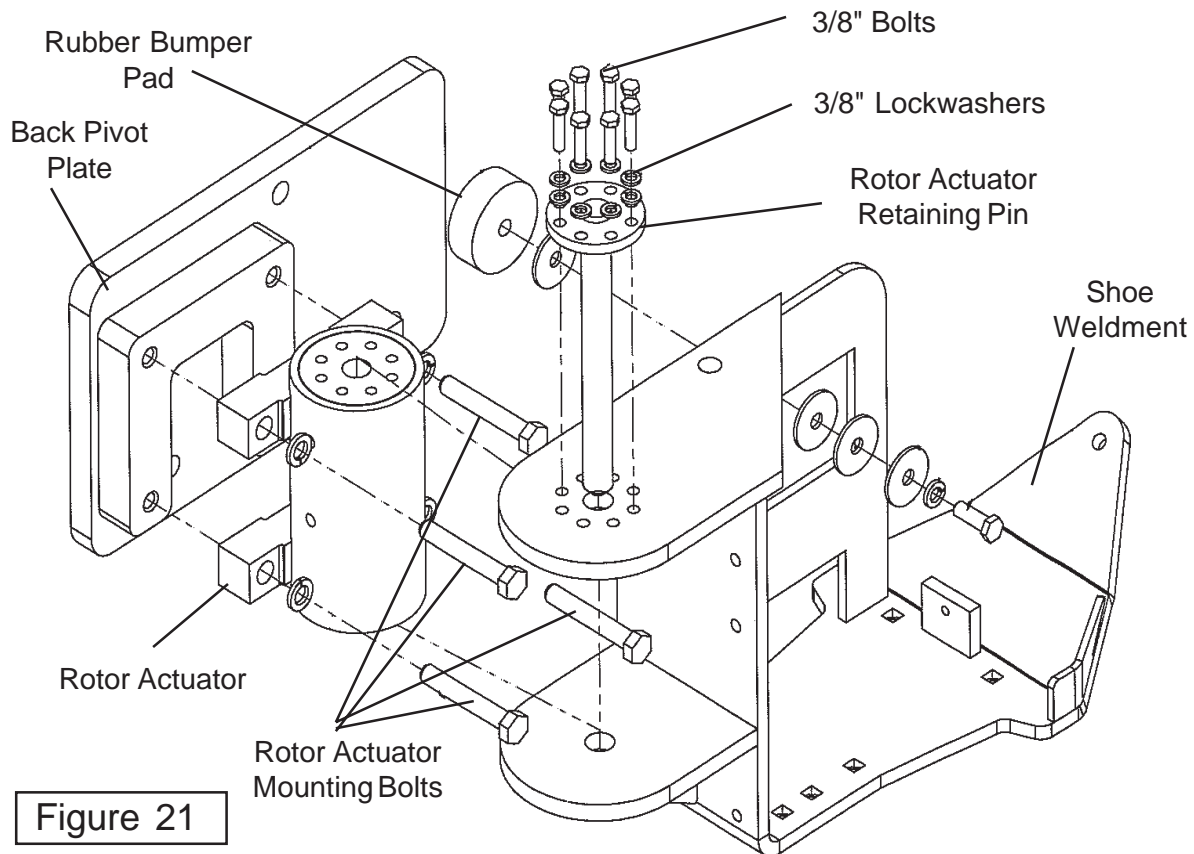


Figure 20

INNER SHOE WELDMENT REPLACEMENT

6. If the Back Plate has been removed from the carriage arm, it will have to be reset after the reassembly is done. See the Pitch adjustment in previous instruction (See Figure 4). The adjustment to the cutter bar should be check and reset if required after reassembly.

7. Before beginning the reassembly read this section as well as the section that pertains to the component listed below. This is important that these components be assembled correctly as well as adjusted properly. The assembly of the skid shoe weldment, replacement of the Rotor Actuator, Drive Assembly, Cutter Bar, Skid Shoe and Drive Assembly Cover will be reinstalled by reversing the disassembly instructions. (See Figure 10 thru 21)



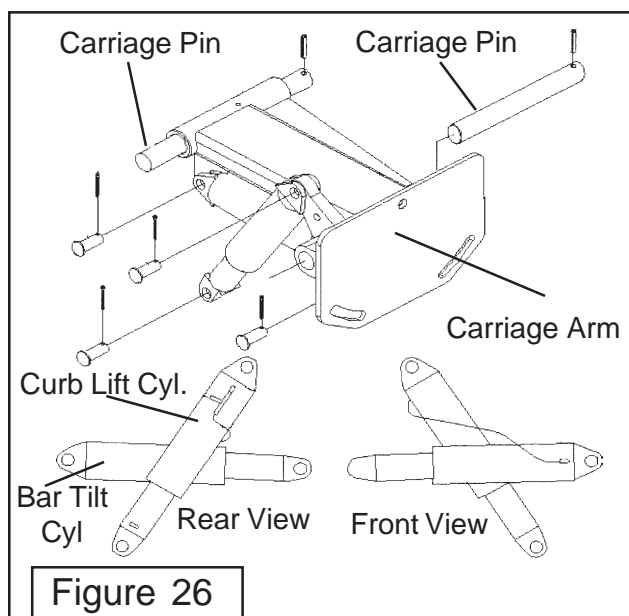
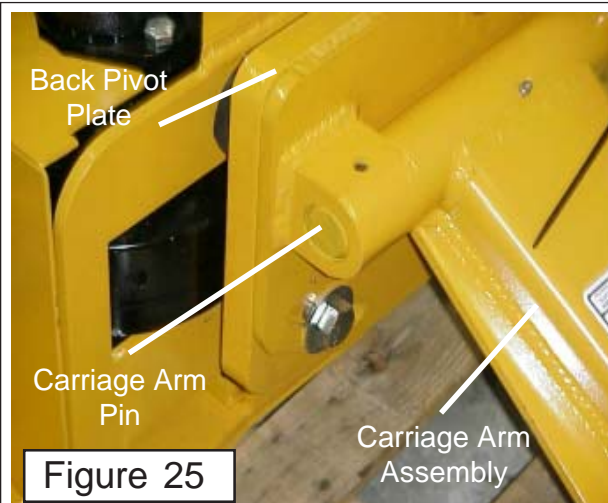
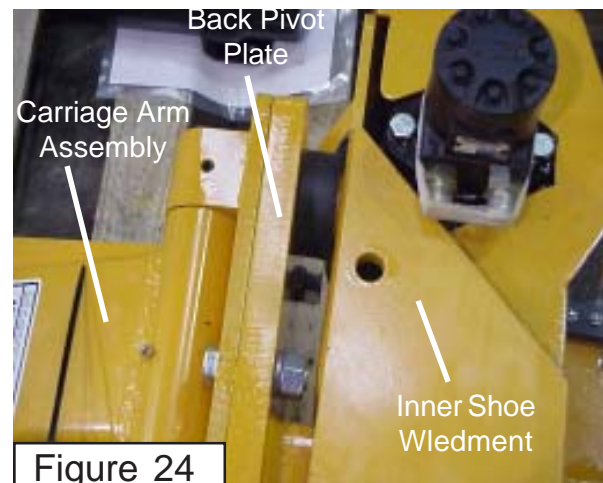
CARRIAGE ARM ASSEMBLY REPLACEMENT

Carriage Arm Assembly Replacement:

The carriage arm replacement will require the Back Pivot Plate to be unbolted with the skid shoe / break-a-way assembly to be removed with Back Pivot but not disassembled. The skid shoe / break-a-way assembly can be removed by unbolting the back pivot plate from the carriage arm (See Figure 17 thru 25). The hydraulic hoses to the motor will not have to be disconnected but the hose brackets may have to be disconnected to allow the assembly to be moved outward far enough to clear carriage arm assembly. If the complete cutterbar / break-a-way assembly needs to be moved it is sometimes easier and cleaner to unbolt the motor and the complete assembly can be removed as the motor can be moved out of the way with the hoses attached to it. DO NOT pull assembly with the hoses attached and damage them.

To remove the carriage arm the lift and tilt cylinder will need to be disconnected, the hoses will not require disconnecting, the cylinders can be set aside with the hoses connected. Remove the roll pins from the carriage pin. The carriage arm is pinned to the back pivot plate and the tractor main-frame. The mounting frame to attach to the tractor will vary from tractor model, but the way the carriage arm is pinned to will not. Drive the carriage pins out and carriage arm will lift out (See Figure 24, 25 & 26).

To reassemble the carriage arm reverse the disassembly instruction, insert carriage arm, insert carriage arm pins, install roll pin in to carriage arm pin. Install the lift and tilt cylinders, make certain hoses connecting to the cylinders is not twisted or routed wrong as they could be damaged. Attach the back pivot plate with the carriage pin. Bolt the cutterbar / skid shoe assembly to the back pivot plate, note the two lower holes in back pivot plate are slotted on a curve. Flatwashers will have to be used on these two lower bolts (See Figure 25). The pitch of the cutter bar will have to be readjusted, see pitch adjustment instructions in earlier pages (See Figure 4 & 26)



KNIFE DRIVE REPAIR / REPLACEMENT

Knife Drive Assembly Repair / Replacement:

1. The knife drive assembly will be limited to the parts that can be replaced. The Actual knife drive subassembly is not a repairable part and will not have replacement parts available, components on the knife drive assembly can be replaced only.

2. It will not be require to remove any of the hydraulic hoses or even take them loose. The Motor can be unbolted from the drive assembly and laid aside with the hoses still connected. The motor has a splined shaft that mates to the hub adapter.

3. Looking down at the planetary drive (and Hydraulic Motor Assembly) there are four nuts in the plate that is attached to the drive assembly. Remove these four nuts, if you want to remove the four carriage bolts the skid shoe will have to unbolted and removed. When lifting the drive assembly up and away from the cutter bar take notice of the four tube spacers under the drive assembly, there are two different length of the spacers. The short ones go to the rear and the long ones go to the front (See Figure 22)

4. **There are two ways to remove the knife drive assembly** from the cutter bar knife head weldment.

5. **1 st.** is to remove the two knife drive bolt that retain the knife drive stud to the drive assembly support bracket, this allows the drive stud bearing assembly to stay with the cutterbar (See Figure 27) .

6. **Or 2 nd.** there is a clamp bolt on the Knife Head Weldment, loosen the clamp bolt, this will allow the Knife drive stud bearing to pull out of the knife head weldment clamp or off the knife drive stud bearing assembly. (See Figure 23 & 24) Once the drive assembly has been lifted off you will see a nylon bearing in the knife bar head clamp, it should have stayed in the clamp or it could have stayed on the knife drive stud bearing assembly (See Figure 23 & 27)

7. The Hub Adapter is bolted to the Flywheel with four bolts, the flywheel is pressed down over the top shaft of the drive subassembly. The Knife stud bearing support bolts to the bottom of the drive subassembly with two bolts. The Knife drive stud bearing bolts to the support bracket (See Figure 27). If you unbolted the stud drive and left it in the cutter bar it should be removed and inspected. This stud drive is a sealed bearing drive assembly, there are no replaceable parts in it so it can only be replace as an assembly. To check the stud drive bearing assembly hold the top where the two bolts mount it to the support bracket. Grab the OD of the stud drive and the outer cover should spin freely while the top for the two bolts will not, it should not be rough or out of round. To work properly it must be free and smooth turning. Check the nylon bearing in the knife head weldment, it has to be in good condition also. This nylon bearing does not turn when installed, it acts solely as a bushing between the clamp and stud drive bearing assembly and prevent the clamp from crushing the drive stud bearing. (See Figure 22, 23 & 27)

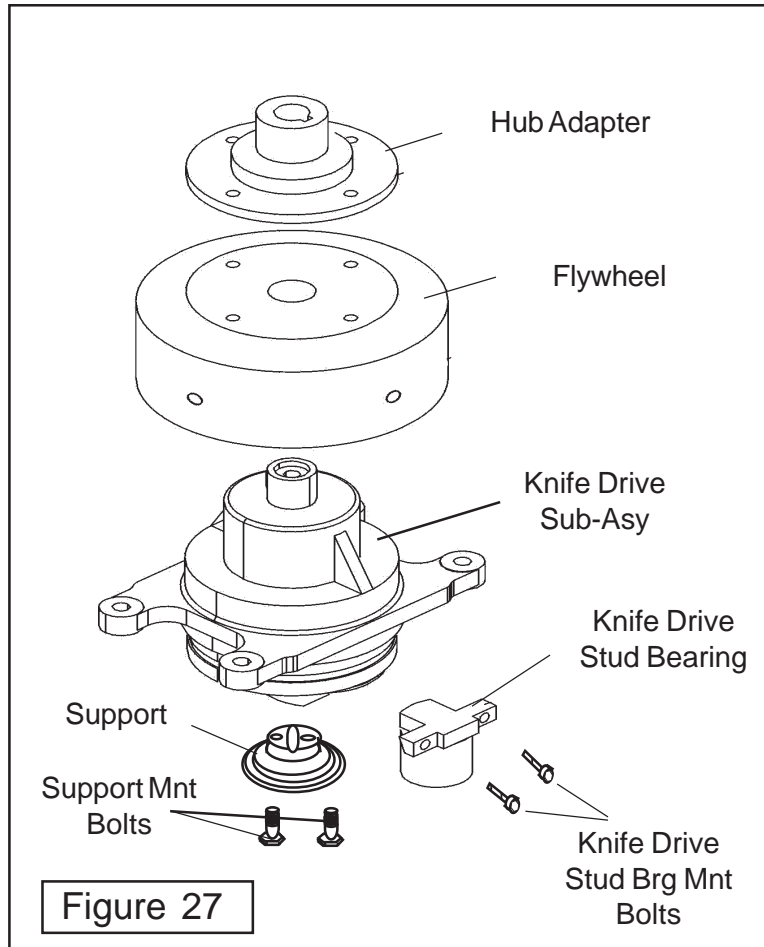
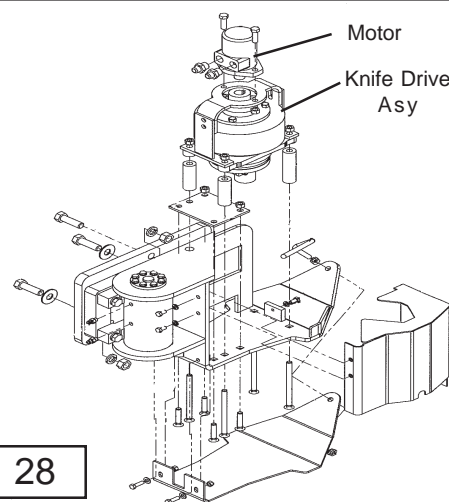


Figure 27

KNIFE DRIVE REPAIR / REPLACEMENT

8. To reassemble the Knife Drive Assembly reverse the disassembly steps but first the cutter bar must be made ready. If the drive stud assembly was not removed from cutterbar knife head weldment (See Figure 22, 23 & 27) and you do not plan to loosen the clamp around the nylon nearing on knife drive stud, you will not need to do this. IF the drive stud is removed the cutter bar head clamp will need to be prepared. Loosen the clamp bolt to where the nylon bearing (bushing) can be installed into the clamp, reinstall the clamp bolt into clamp **BUT DO NOT** tighten clamp bolt. Insert the drive stud bearing into the nylon bearing of clamp, still **DO NOT** tighten the clamp bolt.
9. Install the support bracket to the lower side OD the knife drive assembly, these are two 8 mm bolts that screw into the knife drive assembly bottom side. Torque the 8 mm bolts to 20 ft. lbs.
10. Install the Tube spacers over the carriage bolts, remember the long ones go in the front and the short ones go in the rear. Set the drive assembly down over the four bolts where it is setting on the four tube spacers. Install the motor adapter down over the same four bolts (See Figure 28), The Drive assembly can be tightened down now, these are 1/2" grade 8 plow bolts and should be torqued to 100 to 110 ft. lbs.
11. From the bottom of the drive assembly turn the drive assembly, (there are holes in the outer diameter of the flywheel that can be used to turn it by inserting a bar into the hole). Align the drive assembly support bracket with the two bolt holes for the drive stud bearing, **KEEP YOUR HAND** away from the cutting blades they are sharp. After the two 10 mm bolts are installed into the drive stud bearing torque them to 35 ft. lbs. The drive assembly can be checked prior to bolting on the motor. Use a punch or rod that can be inserted into the hole on the OD of the flywheel (KEEP YOUR HANDS OUT OF THE KNIVES). This will check to make certain the cutter bar is not binding and also check to make certain the drive stud bearing is rotating freely.
12. With the drive assembly bolted down to the skid shoe weldment and the knife drive stud bolted to the support bracket at the bottom of the knife drive assembly. The Clamp Bolt on the knife head weldment will need to be tighten down, **CAUTION MUST BE USED** when tightening the clamp bolt to prevent the knife drive stud bearing from being damaged. Before tighten you should be able to slide the knife head weldment with the nylon bearing in it to slide the bearing and knife head weldment up and down slightly on the knife drive stud bearing. Slowly tighten the clamp bolt checking this up and down movement. When you have tighten the clamp bolt and all the up and down movement between the knife head weldment (Nylon Bearing) is removed the clamp bolt will be tight enough. Do not over tight clamp bolt as damage to the knife drive stud bearing can be damaged. The Knife head weldment clamp has to be in the right position up and down on the knife drive stud bearing so the cutter bar in center for height to match the cutter bar.
13. Install the Motor onto the hub adapter by aligning the Key on the motor shaft with the key slot in the adapter hub. Install and tighten the two 1/2"-NC X 1-1/4" GR 5 bolts that retain the motor to the drive assembly (See Figure 28). the hoses should all ready be connected, but if they are not you will need to consult the hydraulic schematic (See Figure 1) showing the hose routing for the motor.
14. Recheck all the installation to make certain that the bolts have all been installed and are tightened to the required torque. Make certain all guards and shield have been reinstalled before starting tractor or mower.



NOTE

Section 8

SWITCHBLADE

**New Holland Tractor
TN60D, TN 60DA, TN70D,
TN70DA, TN75D & TN75DA**

**Mount Kit Components
Identification**

Mount Kit - Bill of Material (Cab)

New Holland - Cab/2&4wd TN60DA/70DA/75DA & TN55D/65D/70D/75D

As Of Date: 6-23-03

LT 235/85 R16 Min / 11.2-24 Max front tire
16.9-24 (R-4) Min / 16.9-30 Max rear tire

Mount Kit:

Subframe Kit02980118

Hydraulic Kits:

Hydraulic Kit02980119

Options:

Pump Guard02977682
Knife Brackets (2 req'd)0487100
Hydraulic Break-Away Hose Kit02982554
Virginia DOT Option Kit (Sept. 2002 Bid Spec.)02982658*
Cab Mirror Kit (TN-DA Series Only - See Photo)02982794
Two-Spool Valve Coupler Kit (Converts to 3/8" Flat-Face) .02982799

Important notes:

- 1 First cut from tractor center line is approximately 58".
2. The oil reservoir is rotated for tire clearance and stability (see picture below).
3. Switchblade frame will maintain 9" of ground clearance when the tractor is equipped with the minimum tires listed above.

* Virginia DOT Option Kit (Sept. 2002 Spec.) P/N 02982657 Includes following 8 items

tem	Part No.	Qty	Description
1	02982615	1	FILTER, OUTER AIR - NH#1930587
2	02982616	1	FILTER, INNER AIR - NH#1930588
3	02982617	1	FILTER, HYDRAULIC- NH#47131194
4	02982618	1	FILTER, ENGINE OIL- NH#47135703
5	02982619	1	FILTER, FUEL NH#47135706
6	02982620	1	FILTER, CAB FOAMCVR NH#47131888
7	02982621	2	FILTER, OUTR CAB NH#47135038
8	02982622	1	FILTER, 2ND OUTRCAB NH#47135044

Switchblade (NH-TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA , Asy. Man.) 06 / 05

Mount Kit - Bill of Material (Cab)



Optional Outside Corner Mirror Kit

Mount Kit - Bill of Material (CAB)

IMPORTANT NOTICE: The following Part / Assembly Numbers are for reference and should not be ordered as replacement parts, unless all the components in that assembly are wanted. These will break down to bills of material of the components. Some of numbers listed are NOT individual Parts but complete assemblies and/or box of assemblies. Check before ordering.

Sub-Frame Kit P/N 02980118 (RH Wing Only): Includes Items Below

(New Holland TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA Cab/2&4wd)

Item	Part No.	Qty	Description
1	00000200	4	NUT, 3/4 "-NC HEX PL
2	00003901	4	LOCKWASHER, 3/4 " PL
3	0112400	1	PIN-TRIUMPH STOP
4	0114600	1	PIN-HAIR
5	02965236	4	BOLT, HEX HEAD 3/4"-NC X 9-1/2" PL GR8
6	02975125	1	AXLE MOUNT STRAP
7	02975738	2	BOLT, HEX HEAD M20-P2.5 X 70MM PL GR10.9
8	02976463	2	BOLT, HEX HEAD M20-P2.5 X 40MM PL GR10.9
9	02980079	1	WELDMENT SUBFRAME WELDMENT
10	5312316	4	FLATWASHER, 3/4" HARDENED
11	02971158	4	LOCKWASHER, 20MM
12	0665400	1	SUBFRAME
13	00753753	4	BOLT, HEX HEAD 5/8"-NC X 2" PL GR 8
14	00695100	4	LOCKNUT, TOPLOCK 5/8"-NC

Above items are included in Switchblade Sub-Frame Kit P/N 02980118

Hydraulic Kit P/N 02980119 (RH Wing Only) : Includes items below

(New Holland TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA Cab/2&4wd)

Item	Part No.	Qty	Description
1	00011100	8	FLATWASHER, 3/8" STD
2	00011400	4	BOLT, HEX HEAD 3/8"-NC X 1"
3	00015800	8	LOCKNUT, TOPLOCK 3/8"
4	00023100	3	BOLT, HEX HEAD 3/8"-16NC X 1-1/2" PL GR5
5	00023500	6	FLATWASHER, 5/16" PL
6	000849	1	ELBOW, STREET 45 DEG.
7	000859	12	PLASTIC TIE
8	001636	2	BOLT, HEX HEAD 1/4"-NC X 2"
9	0022400	2	ADAPTER, HYD ELBOW 12MP-12FP90
10	0022800	1	BUSHING, REDUCING
11	00750940	3	LOCKNUT, TOPLOCK 5/16"-NC PLB
12	0148600	1	KEY
13	0222100	2	FITTING, HOSE BIB #16HOSE-12MP
14	02733700	3	BOLT, HEX HEAD 5/16"-NC 4-1/2" PL GR5
15	02959924	2	LOCKNUT, TOPLOCK 1/4"-NC PLB
16	02966687	2	YOKE, ADJUSTING
17	02966688	2	CLEVIS PIN, 3/16" X 7/8"
18	02968698	2	COTTER PIN, 3/32" X 3/4"

Continued Next Page

Mount Kit - Bill of Material (CAB)

Continued From Previous Page

Item	Part No.	Qty	Description
19	02968850	1	ADAPTER, HYD STRAIGHT 8MB - 6MJ
20	02971158	6	LOCKWASHER, 20MM
21	02974296	1	SWITCH MOUNT WELDMENT
22	02974323	2	ANGLED SINGLE AXIS CONTROL ASY
23	02975110	1	PULLEY ADAPTER, MACHINED
24	02975133	1	DRAWING, .ADAPTER & CRANKSHAFT PULLEY
25	02975150	3	BOLT, HEX HEAD, M10-P1.25 X 70MM PL GR10.9 (use w/Item 23)
26	02975186	1	ADAPTER, HYD STRAIGHT 16MB - 12FP
27	02975187	1	ADAPTER, HYD ELBOW 12MB - 8MJ 45
28	02975188	1	COUPLER ASY, FLEX
29	02975200	1	DRAWING, REMOTE CONTROL ASY INSTRUCTIONS
30	02976279	1	DRIVESHAFT, 25.25 7/8-13SPL X
31	02976283	1	PUMP MOUNT, MACHINED
32	02976463	4	BOLT, HEX HEAD M20-P2.5 X 40MM PL GR10.9
33	0741300	2	HOSE CLAMP, STEEL, HEXSCREW
34	001979	1	HOSE #4 - 4FJX90 - 4FJX - 72"LG
35	02980088	1	HOSE #4 - 4FJX - 4FJX90° - 80"LG
36	02980089	1	HOSE #6 - 6FJX - 6FJX90° - 27"LG
37	02980090	1	HOSE #6 - 6FJX - 6FJX90° - 68"LG
38	02961852	1	HOSE #8 - 8FJX - 8FJX90 - 72"LG
39	02890700	2	HOSE #8 - 8FJX - 8FJX - 90"LG
40	02980078	1	VALVE MOUNT WELDMENT
41	02962022	3	ADAPTER, HYD ELBOW 4MJ - 4FJX 90°
42	001921	1	ADAPTER, HYD ELBOW 6MJ - 6FJX 90
43	02962749	2	ADAPTER, HYD ELBOW 8MJ - 8FJX 45°
44	00755954	3	LOCKWASHER, M10 SPRING (use w/Item 23)
45	02966874	1	BOOT, CABLE
46	00900913	12	CORDURA SLEEVING, 2.54 ID BLACK
47	02979318	1	PLATE, BELT COVER
48	02974303A	1	PUMP ASY, TANDEM GEAR ED 0.98/0.37 CID
49	02981351	2	BOLT, SOCKET HEAD, M20-P2.5 X 30MM PL GR10.9
50	01501075	5	BULK HYD HOSE #16 SAE100R4
51	02971203	2	CABLE, REMOTE CONTROL-102"LG
52	02982555	1	WLDMT CONTROL STAND
53	10190000	1	BOLT, HEX HEAD 3/8"-NC X 2-1/4" PL GR5

Above items are included in Switchblade Hydraulic Kit P/N 02980119

Mount Kit - Bill of Material (CAB)

Cab Mirror Kit Option P/N 02982794 : Includes items below

(New Holland TN60D, TN 60DA, TN70D, TN70DA, TN75D & TN75DA Cab/2&4wd)

Item	Part No.	Qty	Description
1	02982758	2	MIRROR, 8 1/2" CONVEX-BLK STEEL
2	02982717	2	BRACKET, MIRROR NH TN-A CAB
3	02970065	4	LOCKWASHER, 8MM
4	00751693	4	BOLT, HEX HEAD, M8-P1.25 X 16MM PL GR8.8

Above items are included in Mirror Kit P/N 02982794

Hydraulic Break-A-Way Hose Kit P/N 02982554 : Includes items below

(For New Holland TL80A/90A/100A Cab/2&4wd)

Item	Part No.	Qty	Description
1	001978	1	HOSE #4 - 4FJX90 - 4FJX - 69LG
2	02972669	1	HOSE #4 - 4FJX - 4FJX90-109LG
3	001846	1	HOSE #4 - 4FJX90 - 4FJX - 63LG
4	02962022	2	ADP HYD ELBOW 4MJ-4FJX 90°
5	00900913	3.5 ft.	CORDURA SLEEVING 2.54 ID BLACK

Above items are included in Hydraulic Break-a-way Hose Kit P/N 02982554

Knife Bracket Kit Option P/N 0487100 : Includes items below

(For New Holland TL80A/90A/100A Cab/2&4wd) Two Kits required for Tracotr

Item	Part No.	Qty	Description
1	02989821	1	KNIFE BRACKET WELDMENT
2	048710D	1	Pin
3	0114600	1	Hair Pin

Above items are included in Knife Bracket Kit Option P/N 0487100 (two kits required per tractor when ordering this option)

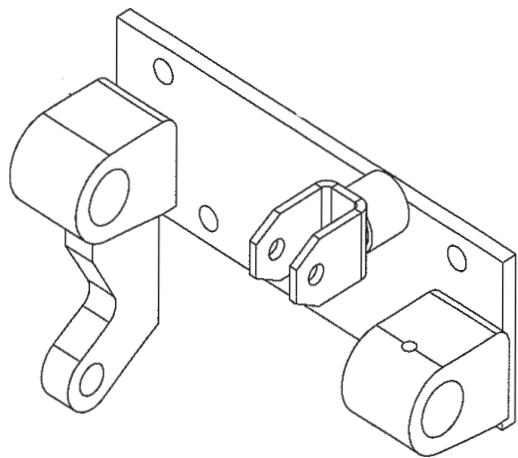
Pump Guard Kit Option P/N 02987682 : Includes items below

(For New Holland TL80A/90A/100A Cab/2&4wd)

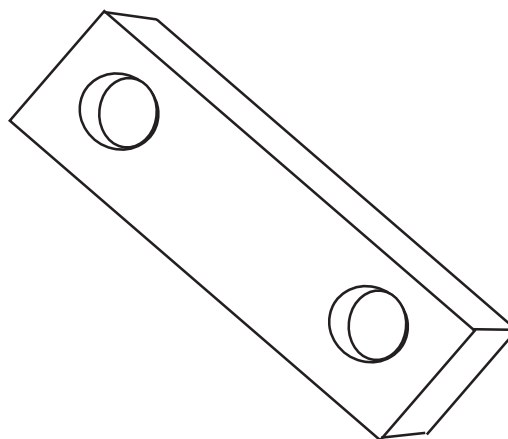
Item	Part No.	Qty	Description
1	02971158	4	LOCKWASHER, 20MM
2	02975692	4	BOLT, HEX HEAD M20-P2.5 X 50MM PL GR10.9
3	02977672	1	PUMP GUARD WELDMENT TN 55/65/70/
4	02977697	1	DRAWING, INSTRUCTION, PUMP GUARD NH TN
5	02971943	1	DECAL, ALAMO INDUSTRIAL YELLOW

Above items are included in Bumper Guard Kit P/N 02987692

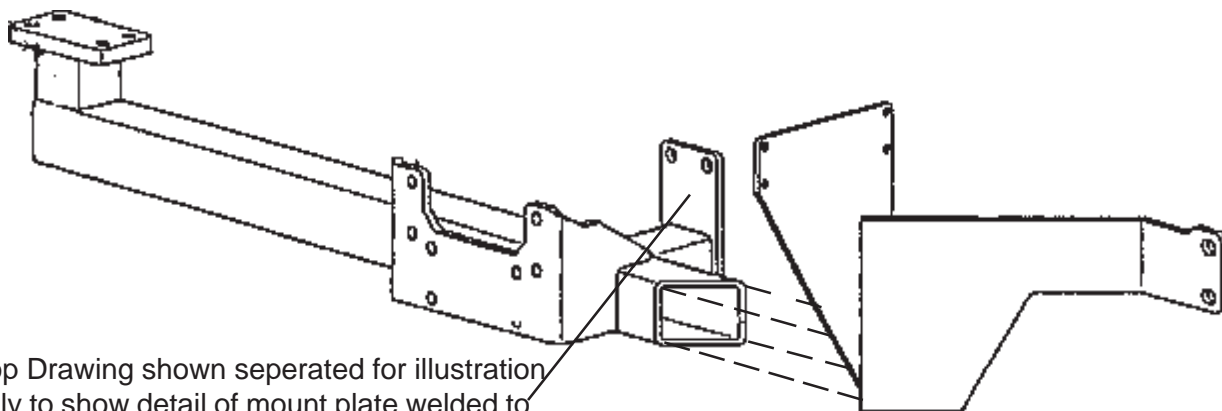
Mount Kit Component Identification



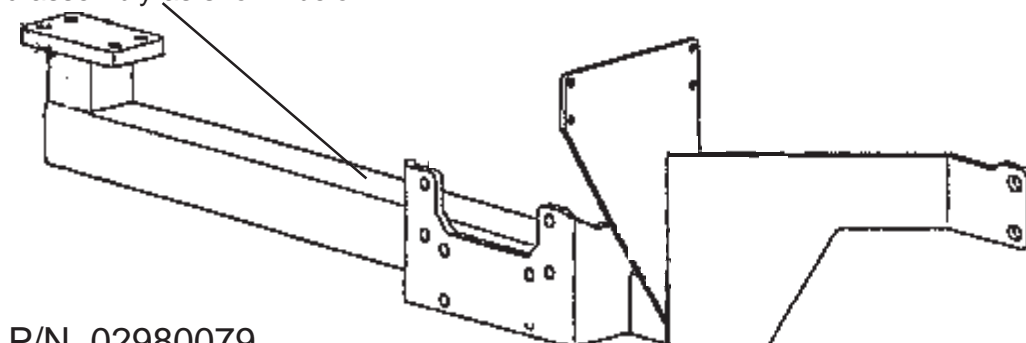
P/N 0665400
Sub-Frame Weldment



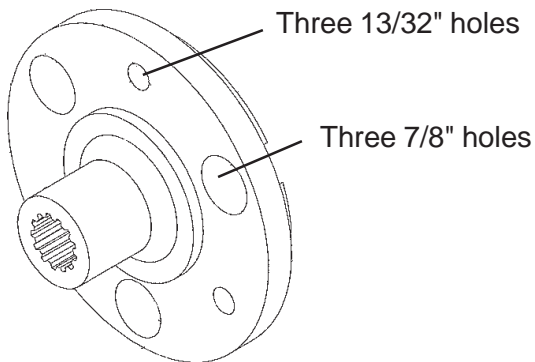
P/N 02975125
Axle Mount Strap



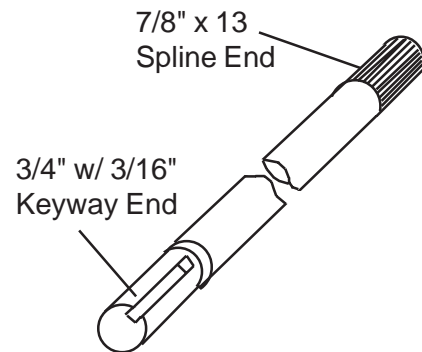
Top Drawing shown seperated for illustration only to show detail of mount plate welded to frame rail, this frame rail will be shipped as a welded assembly as shown below



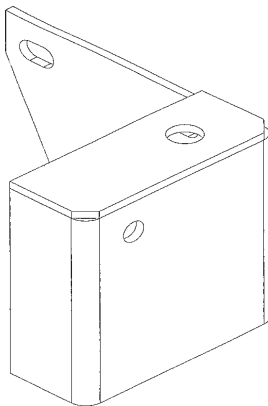
P/N 02980079
Frame Weldment



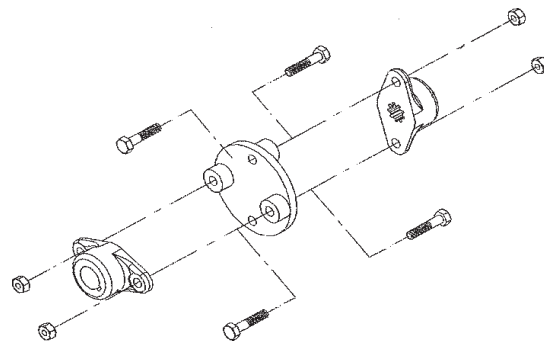
P/N 02975110
Crankshaft Pulley Adapter



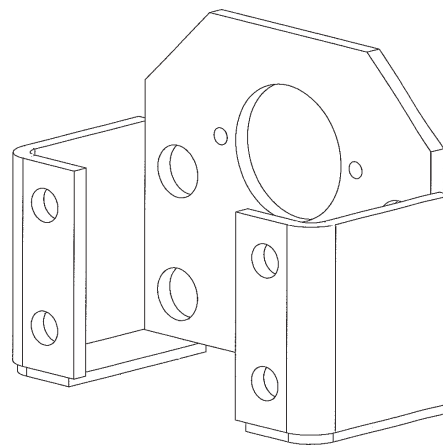
P/N 02976279
Drive Shaft



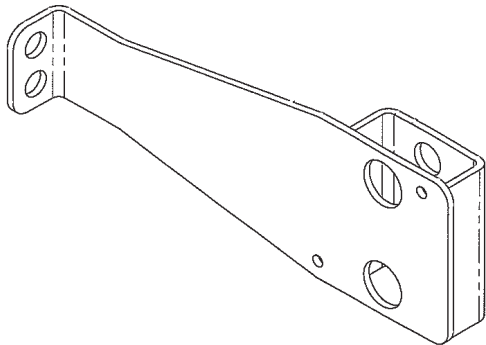
P/N 02974296
Switch Mount Weldment
Use on Cab (Remote
Cable Control) Models



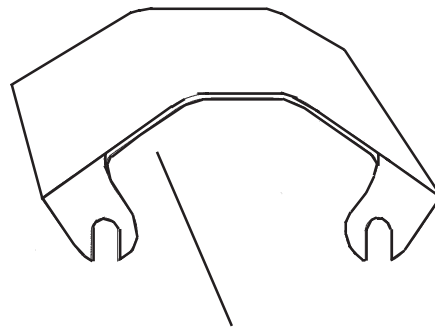
P/N 02975188
Flex Coupler Asy.



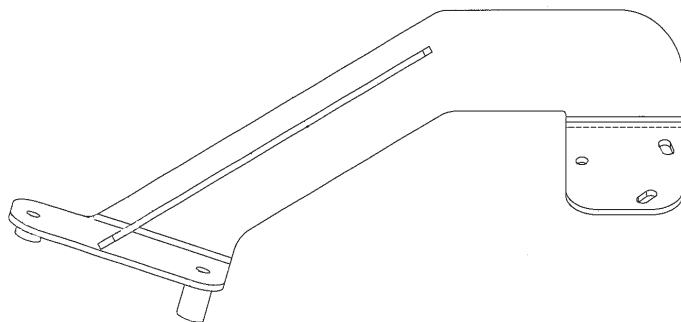
P/N 02976283
Pump Mount, Machined



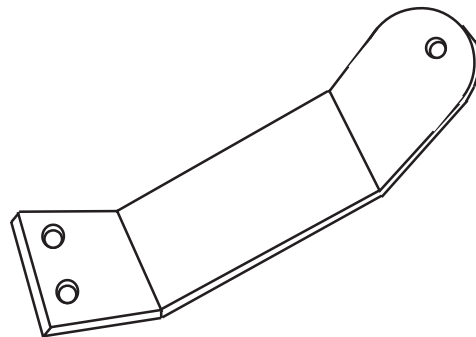
P/N 02980078
Valve Mount
Weldment



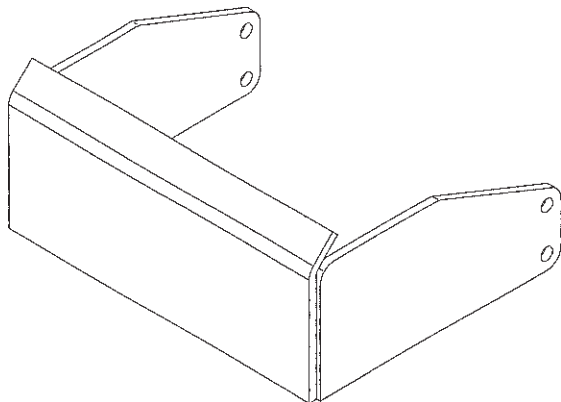
P/N 02989318
Driveshaft Cover



P/N 02982555
Control Stand
Weldment



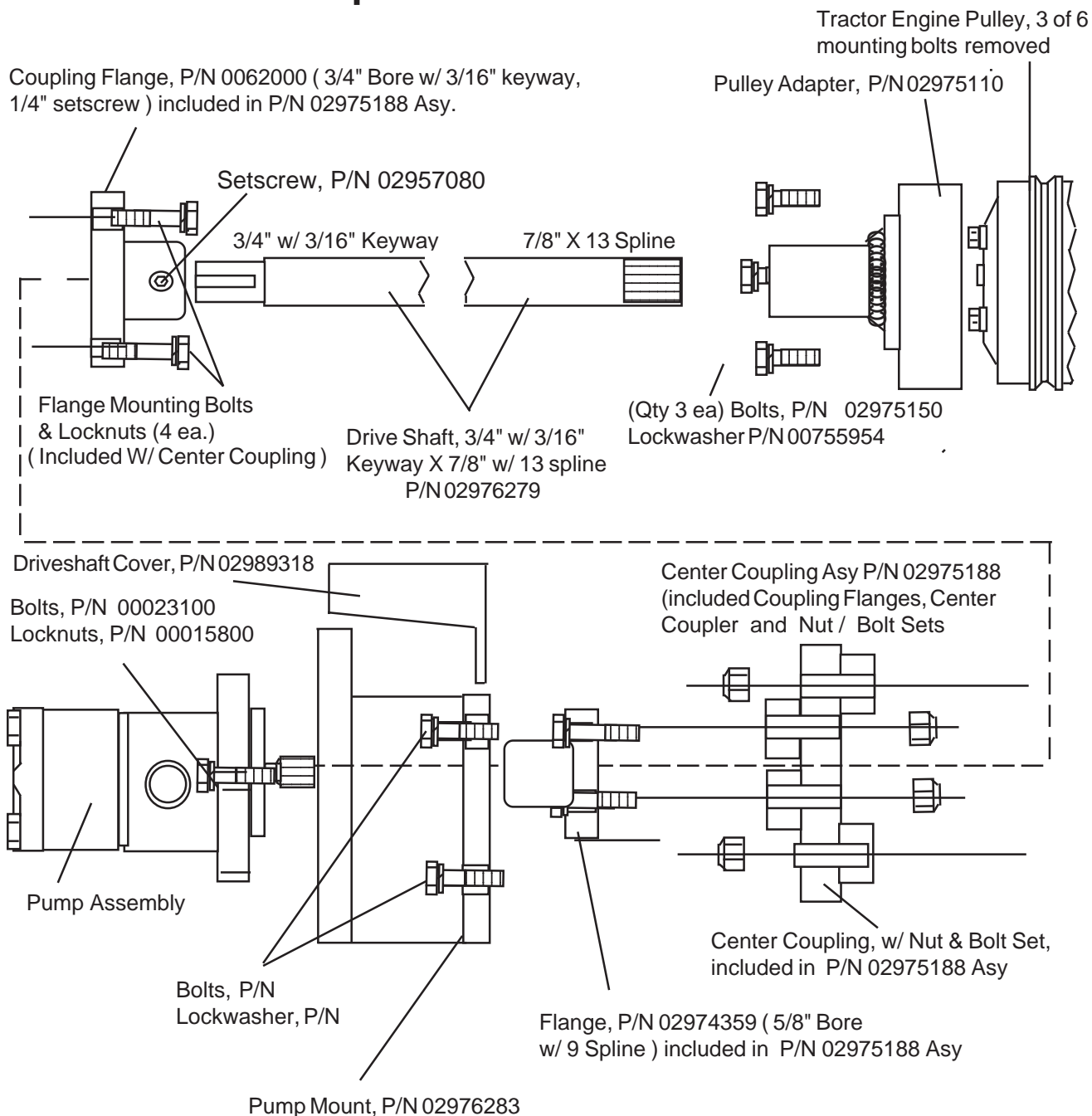
P/N 02982717
Mirror Bracket
(Optional)



P/N 02977672
Pump Guard
Weldment

Mount Kit Component Identification

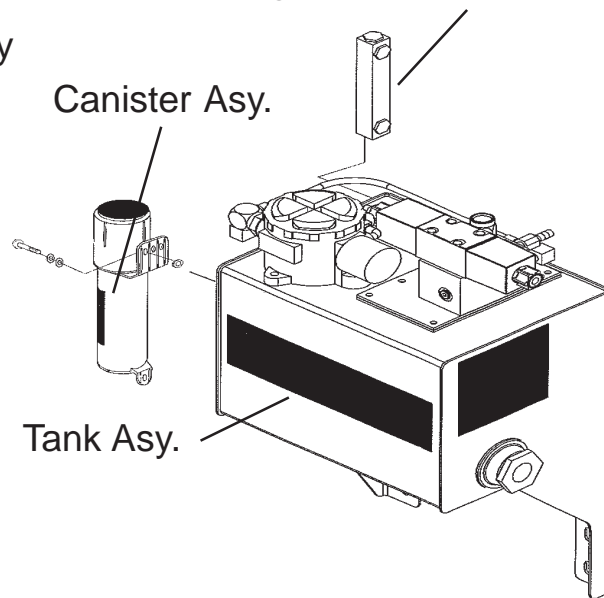
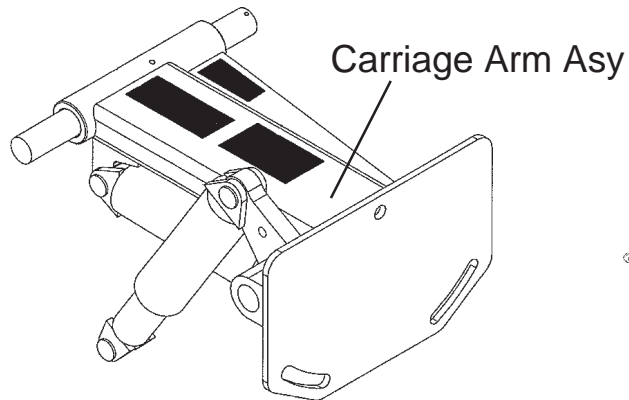
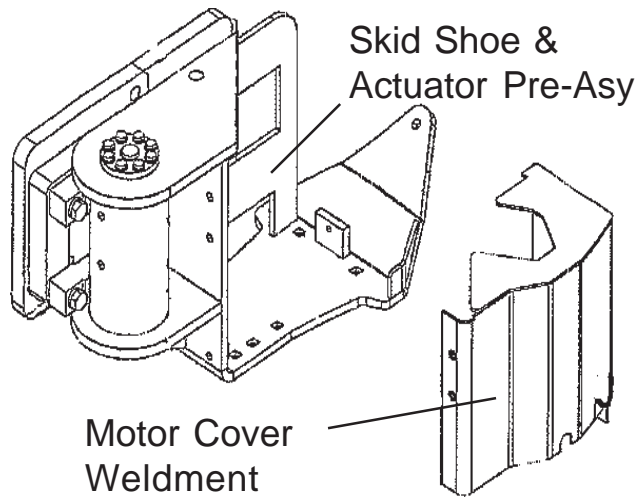
Pump / Driveshaft Schematic



Pump Drive Schematic:

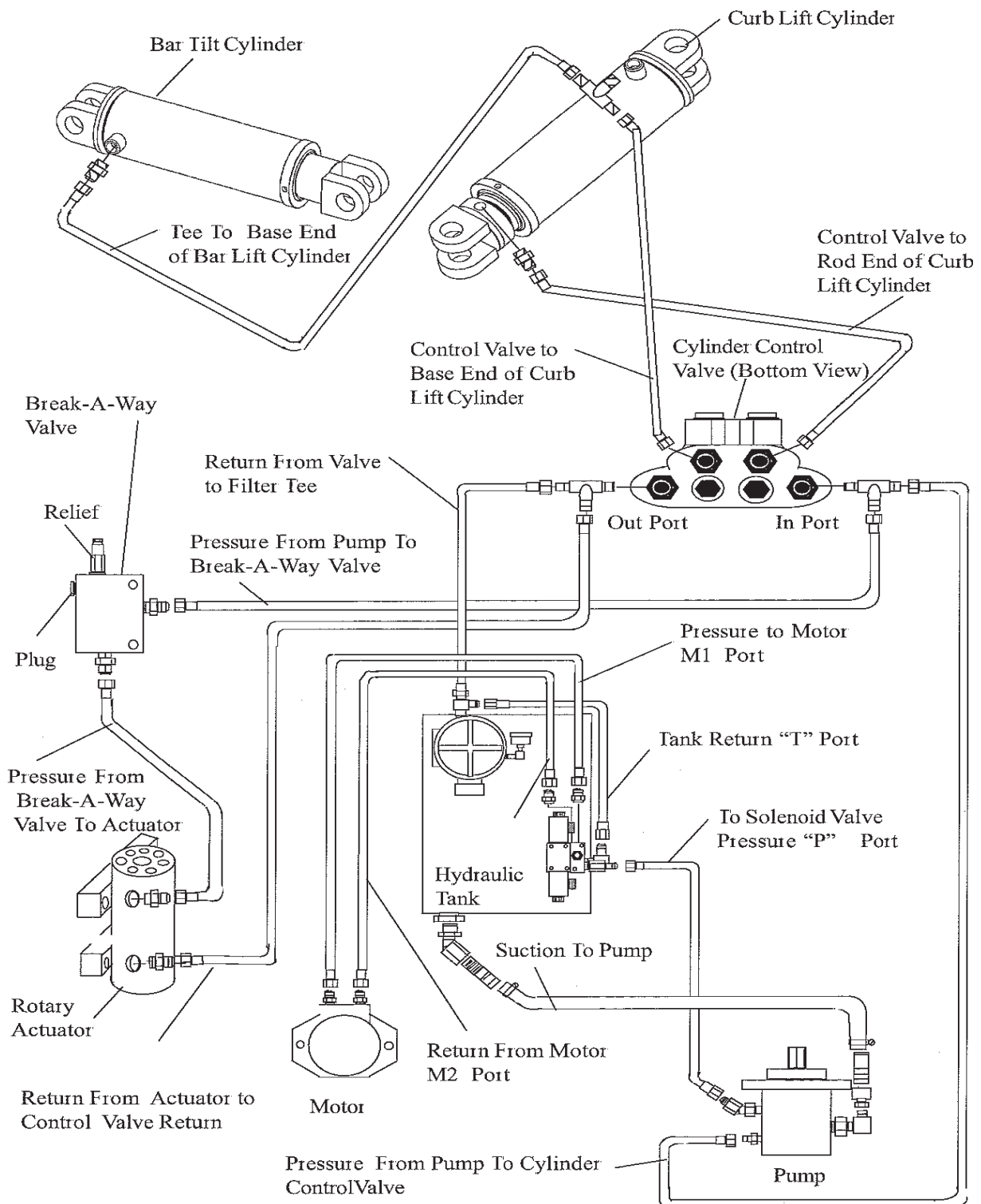
This Section covers the installation of Pump Drive Components, Pump Assembly Some precautions that must be followed during the Assembly Process before unit is ever started for the first time.

Mount Kit Component Identification

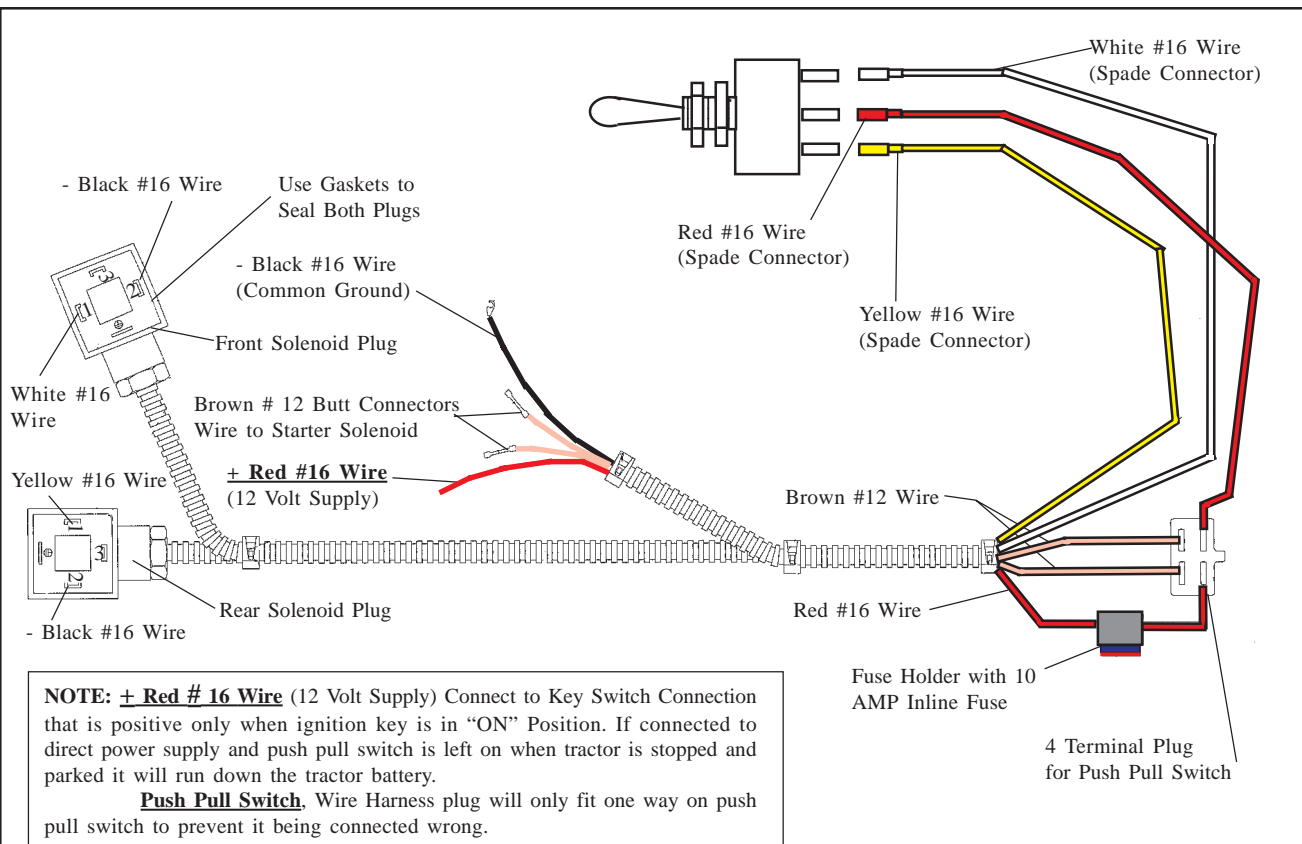


Mount Kit Component Identification

Hydraulic Schematic RH Wing Only



NOTES



This Wire Harness Used for RH Wing



Switch Blade (NH TN60D, TN60A, TN70D, TN70DA, TN75D & TN75DA - D & DA Series Asy. Man.) 06/05

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